GA-Z77-HD4

User's Manual

Rev. 1001

12ME-Z77HD4-1001R

Declaration of Conformity

We, Manufacturer/Importer,

G.B.T. Technology Trading GMbH

Address: **Bullenkoppel 16, 22047 Hamburg, Germany**

Declare that the product

Product Type: **Motherboard**

Product Name: **GA-Z77-HD4**

conforms with the essential requirements of the following directives:

☒ **2004/108/EC EMC Directive:**

☒ Conduction & Radiated Emissions:	EN55022:2006+A1:2007
☒ Immunity:	EN55024:1998+A1:2001+A2:2003
☒ Power-line harmonics:	EN61000-3-2:2006
☒ Power-line flicker:	EN61000-3-3:2008

☒ **2006/95/EC LVD Directive**

☒ Safety:	EN60950-1:2006+A11:2009

☒ **2011/65/EU RoHS Directive**

☒ Restriction of use of certain substances in electronic equipment:	This product does not contain any of the restricted substances listed in Annex II, in concentrations and applications banned by the directive.

☒ **CE marking**

(EC conformity marking)

Signature: Timmy Huang

(Stamp)

Date: Oct. 31, 2012

Name: Timmy Huang

DECLARATION OF CONFORMITY

Per FCC Part 2 Section 2.1077(a)

Responsible Party Name: **G.B.T. INC. (U.S.A.)**

Address: **17358 Railroad Street**
City of Industry, CA 91748

Phone/Fax No: **(626) 854-9338/ (626) 854-9326**

hereby declares that the product

Product Name: Motherboard

Model Number: GA-Z77-HD4

Conforms to the following specifications:

FCC Part 15, Subpart B, Section 15.107(a) and Section 15.109 (a),Class B Digital Device

Supplementary Information:

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful and (2) this device must accept any inference received, including that may cause undesired operation.

Representative Person's Name: ERIC LU

Signature: Eric Lu

Date: Oct. 31, 2012

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Documentation Classifications

In order to assist in the use of this product, GIGABYTE provides the following types of documentations:

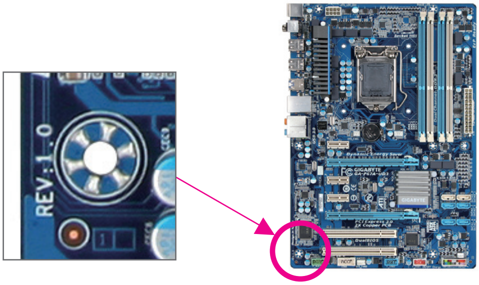
- For quick set-up of the product, read the Quick Installation Guide included with the product.
- For detailed product information, carefully read the User's Manual.

For product-related information, check on our website at: http://www.gigabyte.com

Identifying Your Motherboard Revision

The revision number on your motherboard looks like this: "REV: X.X." For example, "REV: 1.0" means the revision of the motherboard is 1.0. Check your motherboard revision before updating motherboard BIOS, drivers, or when looking for technical information.

Example:



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Box Contents

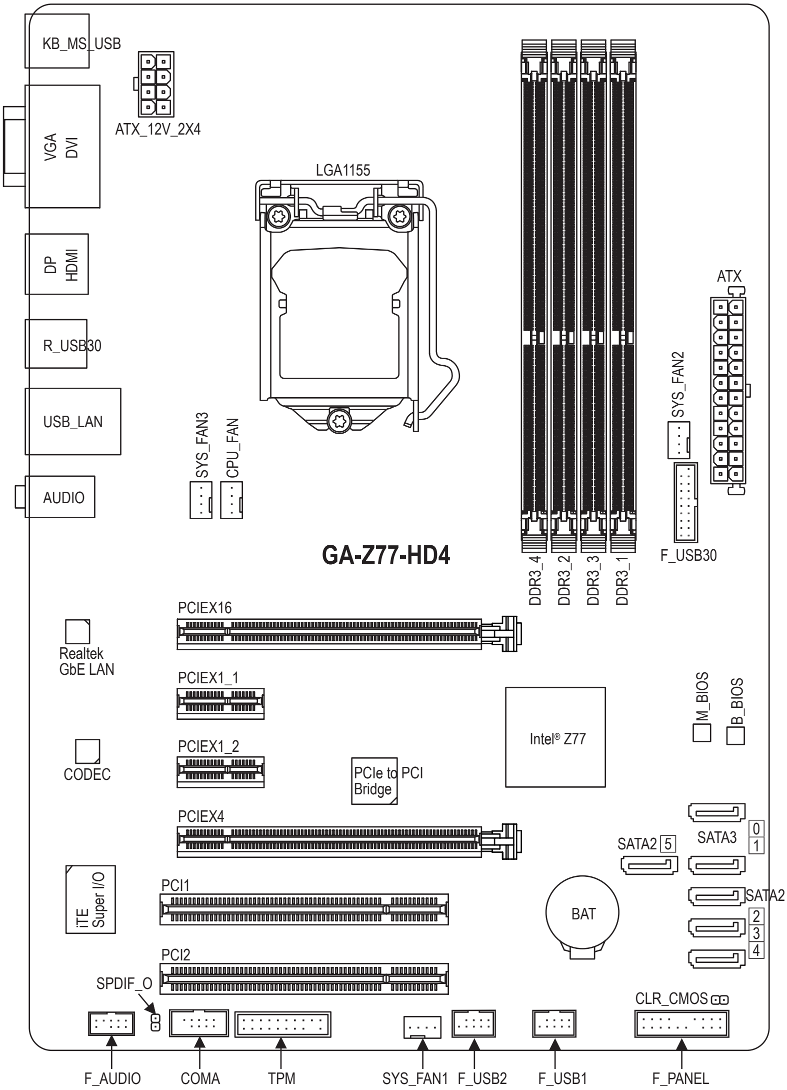
- ☑ GA-Z77-HD4 motherboard
- ☑ Motherboard driver disk
- ☑ User's Manual
- ☑ Quick Installation Guide
- ☑ Four SATA 6Gb/s cables
- ☑ I/O Shield

The box contents above are for reference only and the actual items shall depend on the product package you obtain. The box contents are subject to change without notice.

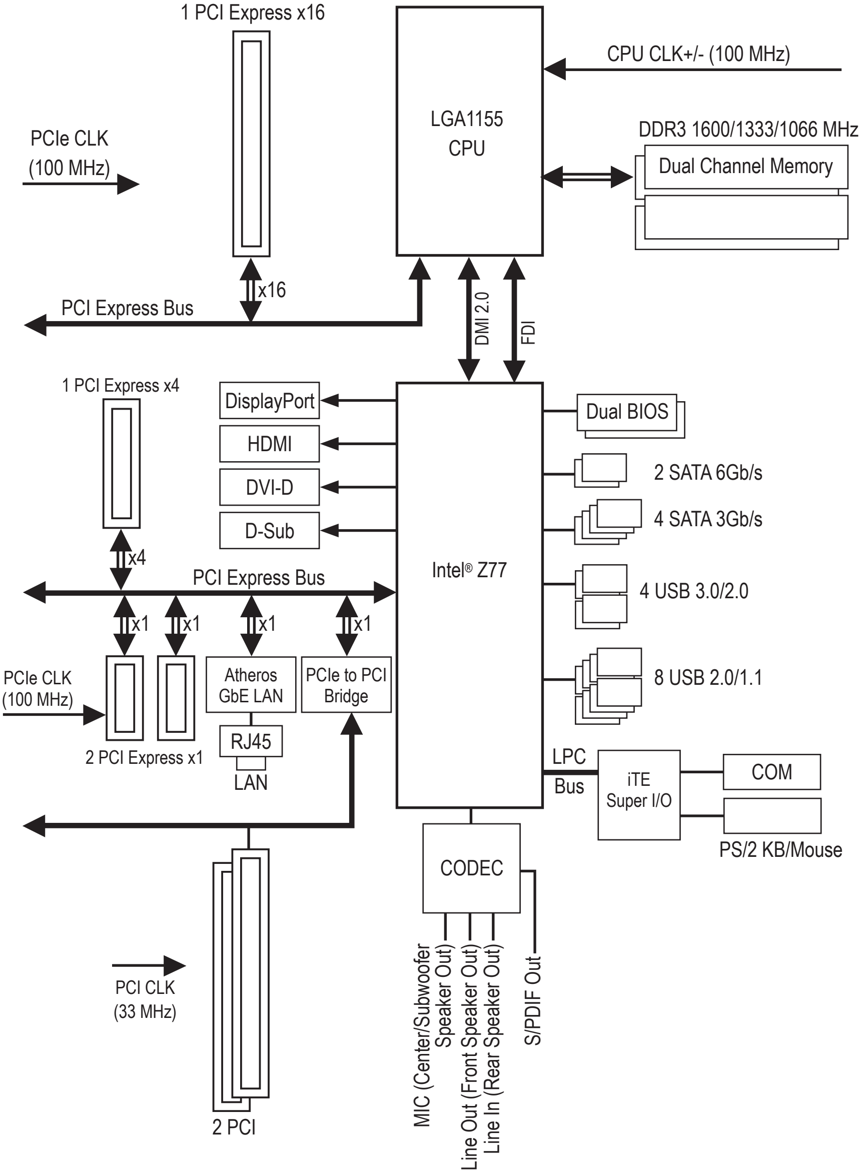
Optional Items

- ☐ 2-port USB 2.0 bracket (Part No. 12CR1-1UB030-6*R)
- ☐ eSATA bracket (Part No. 12CF1-3SATPW-4*R)
- ☐ 3.5" Front Panel with 2 USB 3.0/2.0 ports (Part No. 12CR1-FPX582-0*R)
- ☐ COM port cable (Part No. 12CF1-1CM001-3*R)
- ☐ HDMI-to-DVI adapter (Part No. 12CT2-HDMI01-1*R)

GA-Z77-HD4 Motherboard Layout


KB_MS_USB
ATX_12V_2X4
VGA
DVI
LGA1155
DP
HDMI
ATX
R_USB30
SYS_FAN2
USB_LAN
SYS_FAN3
CPU_FAN
AUDIO
GA-Z77-HD4
F_USB30
DDR3_4
DDR3_2
DDR3_3
DDR3_1
PCIEX16
Realtek
GbE LAN
PCIEX1_1
M_BIOS
B_BIOS
Intel® Z77
PCIEX1_2
CODEC
PCIe to PCI
Bridge
PCIEX4
SATA3
0
1
SATA2
5
PCI1
iTE
Super I/O
BAT
SATA2
2
3
4
PCI2
SPDIF_O
CLR_CMOS
F_AUDIO
COMA
TPM
SYS_FAN1
F_USB2
F_USB1
F_PANEL

GA-Z77-HD4 Motherboard Block Diagram


1 PCI Express x16
LGA1155
CPU
CPU CLK+/- (100 MHz)
DDR3 1600/1333/1066 MHz
Dual Channel Memory
PCIe CLK
(100 MHz)
x16
PCI Express Bus
DMI 2.0
FDI
1 PCI Express x4
DisplayPort
HDMI
DVI-D
D-Sub
Dual BIOS
2 SATA 6Gb/s
4 SATA 3Gb/s
x4
Intel® Z77
PCI Express Bus
4 USB 3.0/2.0
x1
x1
x1
x1
PCIe CLK
(100 MHz)
Atheros
GbE LAN
PCIe to PCI
Bridge
8 USB 2.0/1.1
RJ45
2 PCI Express x1
LAN
LPC
Bus
iTE
Super I/O
COM
PS/2 KB/Mouse
CODEC
PCI CLK
(33 MHz)
2 PCI
MIC (Center/Subwoofer Speaker Out)
Line Out (Front Speaker Out)
Line In (Rear Speaker Out)
S/PDIF Out

For detailed product information/limitation(s), refer to "1-2 Product Specifications."

Chapter 1 Hardware Installation

1-1 Installation Precautions

The motherboard contains numerous delicate electronic circuits and components which can become damaged as a result of electrostatic discharge (ESD). Prior to installation, carefully read the user's manual and follow these procedures:

- Prior to installation, make sure the chassis is suitable for the motherboard.
- Prior to installation, do not remove or break motherboard S/N (Serial Number) sticker or warranty sticker provided by your dealer. These stickers are required for warranty validation.
- Always remove the AC power by unplugging the power cord from the power outlet before installing or removing the motherboard or other hardware components.
- When connecting hardware components to the internal connectors on the motherboard, make sure they are connected tightly and securely.
- When handling the motherboard, avoid touching any metal leads or connectors.
- It is best to wear an electrostatic discharge (ESD) wrist strap when handling electronic components such as a motherboard, CPU or memory. If you do not have an ESD wrist strap, keep your hands dry and first touch a metal object to eliminate static electricity.
- Prior to installing the motherboard, please have it on top of an antistatic pad or within an electrostatic shielding container.
- Before unplugging the power supply cable from the motherboard, make sure the power supply has been turned off.
- Before turning on the power, make sure the power supply voltage has been set according to the local voltage standard.
- Before using the product, please verify that all cables and power connectors of your hardware components are connected.
- To prevent damage to the motherboard, do not allow screws to come in contact with the motherboard circuit or its components.
- Make sure there are no leftover screws or metal components placed on the motherboard or within the computer casing.
- Do not place the computer system on an uneven surface.
- Do not place the computer system in a high-temperature environment.
- Turning on the computer power during the installation process can lead to damage to system components as well as physical harm to the user.
- If you are uncertain about any installation steps or have a problem related to the use of the product, please consult a certified computer technician.

1-2 Product Specifications

CPU	◆ Support for Intel® Core™ i7 processors/Intel® Core™ i5 processors/ Intel® Core™ i3 processors/Intel® Pentium® processors/ Intel® Celeron® processors in the LGA1155 package (Go to GIGABYTE's website for the latest CPU support list.) ◆ L3 cache varies with CPU
Chipset	◆ Intel® Z77 Express Chipset
Memory	◆ 4 x 1.5V DDR3 DIMM sockets supporting up to 32 GB of system memory * Due to a Windows 32-bit operating system limitation, when more than 4 GB of physical memory is installed, the actual memory size displayed will be less than the size of the physical memory installed. ◆ Dual channel memory architecture ◆ Support for DDR3 1600/1333/1066 MHz memory modules ◆ Support for non-ECC memory modules ◆ Support for Extreme Memory Profile (XMP) memory modules (Go to GIGABYTE's website for the latest supported memory speeds and memory modules.)
Onboard Graphics	◆ Integrated Graphics Processor: - 1 x D-Sub port - 1 x DVI-D port, supporting a maximum resolution of 1920x1200 * The DVI-D port does not support D-Sub connection by adapter. - 1 x HDMI port, supporting a maximum resolution of 1920x1200 - 1 x DisplayPort, supporting a maximum resolution of 2560x1600
Audio	◆ Realtek ALC887 codec ◆ High Definition Audio ◆ 2/4/5.1/7.1-channel ◆ Support for S/PDIF Out
LAN	◆ Realtek GbE LAN chip (10/100/1000 Mbit)
Expansion Slots	◆ 1 x PCI Express x16 slot, running at x16 (PCIEX16) (The PCIEX16 slot conforms to PCI Express 3.0 standard.) * For optimum performance, if only one PCI Express graphics card is to be installed, be sure to install it in the PCIEX16 slot. * Whether PCI Express 3.0 is supported depends on CPU and graphics card compatibility. ◆ 1 x PCI Express x16 slot, running at x4 (PCIEX4) ◆ 2 x PCI Express x1 slots (The PCIEX4 and PCI Express x1 slots conform to PCI Express 2.0 standard.) ◆ 2 x PCI slots
Multi-Graphics Technology	◆ Support for AMD CrossFire™ technology

Storage Interface	◆ Chipset: - 2 x SATA 6Gb/s connectors (SATA3 0/1) supporting up to 2 SATA 6Gb/s devices - 4 x SATA 3Gb/s connectors (SATA2 2~5) supporting up to 4 SATA 3Gb/s devices - Support for RAID 0, RAID 1, RAID 5, and RAID 10 * When a RAID set is built across the SATA 6Gb/s and SATA 3Gb/s channels, the system performance of the RAID set may vary depending on the devices being connected.
USB	◆ Chipset: - Up to 4 USB 3.0/2.0 ports (2 ports on the back panel, 2 ports available through the internal USB header) * In Windows XP, the Intel USB 3.0 ports can support up to USB 2.0 transfer speed. - Up to 8 USB 2.0/1.1 ports (4 ports on the back panel, 4 ports available through the internal USB headers)
Internal Connectors	◆ 1 x 24-pin ATX main power connector ◆ 1 x 8-pin ATX 12V power connector ◆ 2 x SATA 6Gb/s connectors ◆ 4 x SATA 3Gb/s connectors ◆ 1 x CPU fan header ◆ 3 x system fan headers ◆ 1 x front panel header ◆ 1 x front panel audio header ◆ 1 x S/PDIF Out header ◆ 1 x USB 3.0/2.0 header ◆ 2 x USB 2.0/1.1 headers ◆ 1 x serial port header ◆ 1 x Clear CMOS jumper ◆ 1 x Trusted Platform Module (TPM) header
Back Panel Connectors	◆ 1 x PS/2 keyboard/mouse port ◆ 1 x D-Sub port ◆ 1 x DVI-D port ◆ 1 x DisplayPort ◆ 1 x HDMI port ◆ 2 x USB 3.0/2.0 ports ◆ 4 x USB 2.0/1.1 ports ◆ 1 x RJ-45 port ◆ 1 x optical S/PDIF Out connector ◆ 3 x audio jacks (Line In/Line Out/Microphone)
I/O Controller	◆ iTE I/O Controller Chip

Hardware Monitor	◆ System voltage detection ◆ CPU/System temperature detection ◆ CPU/System fan speed detection ◆ CPU overheating warning ◆ CPU/System fan fail warning ◆ CPU/System fan speed control * Whether the CPU/system fan speed control function is supported will depend on the CPU/system cooler you install.
BIOS	◆ 2 x 64 Mbit flash ◆ Use of licensed AMI EFI BIOS ◆ Support for DualBIOS™ ◆ PnP 1.0a, DMI 2.0, SM BIOS 2.6, ACPI 2.0a
Unique Features	◆ Support for @BIOS ◆ Support for Q-Flash ◆ Support for Xpress Install ◆ Support for EasyTune * Available functions in EasyTune may differ by motherboard model. ◆ Support for eXtreme Hard Drive (X.H.D) ◆ Support for Smart Recovery2 ◆ Support for Auto Green ◆ Support for ON/OFF Charge ◆ Support for Q-Share ◆ Support for 3D Power ◆ Support for EZ Setup
Bundled Software	◆ Norton Internet Security (OEM version) ◆ Intel® Rapid Start Technology ◆ Intel® Smart Connect Technology ◆ Intel® Smart Response Technology
Operating System	◆ Support for Microsoft® Windows 8/7/XP
Form Factor	◆ ATX Form Factor; 30.5cm x 21.5cm

* GIGABYTE reserves the right to make any changes to the product specifications and product-related information without prior notice.

* Please visit the **Support & Downloads\Utility** page on GIGABYTE's website to check the supported operating system(s) for the software listed in the "Unique Features" and "Bundled Software" columns.

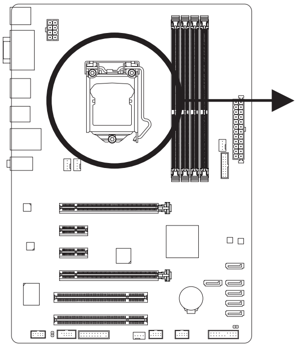
1-3 Installing the CPU and CPU Cooler

Read the following guidelines before you begin to install the CPU:

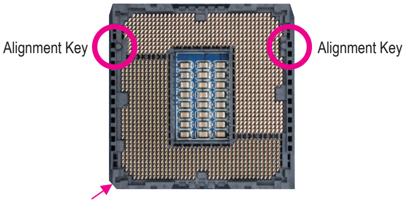
- Make sure that the motherboard supports the CPU.
  (Go to GIGABYTE's website for the latest CPU support list.)
- Always turn off the computer and unplug the power cord from the power outlet before installing the CPU to prevent hardware damage.
- Locate the pin one of the CPU. The CPU cannot be inserted if oriented incorrectly. (Or you may locate the notches on both sides of the CPU and alignment keys on the CPU socket.)
- Apply an even and thin layer of thermal grease on the surface of the CPU.
- Do not turn on the computer if the CPU cooler is not installed, otherwise overheating and damage of the CPU may occur.
- Set the CPU host frequency in accordance with the CPU specifications. It is not recommended that the system bus frequency be set beyond hardware specifications since it does not meet the standard requirements for the peripherals. If you wish to set the frequency beyond the standard specifications, please do so according to your hardware specifications including the CPU, graphics card, memory, hard drive, etc.

1-3-1 Installing the CPU

A. Locate the alignment keys on the motherboard CPU socket and the notches on the CPU.

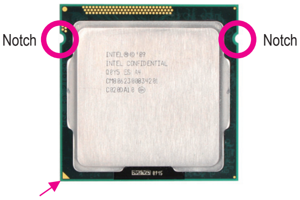


LGA1155 CPU Socket



Pin One Corner of the CPU Socket

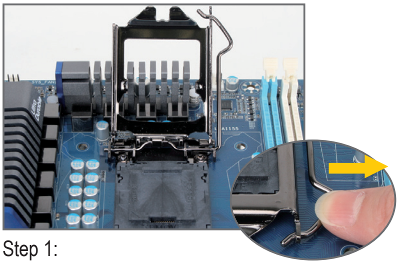
LGA1155 CPU



Triangle Pin One Marking on the CPU

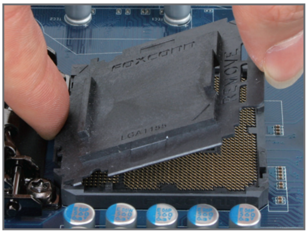
B. Follow the steps below to correctly install the CPU into the motherboard CPU socket.

Before installing the CPU, make sure to turn off the computer and unplug the power cord from the power outlet to prevent damage to the CPU.



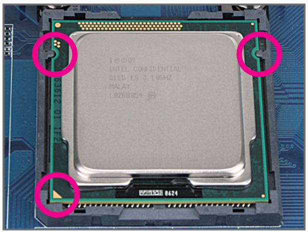
Step 1:

Gently press the CPU socket lever handle down and away from the socket with your finger. Then completely lift the CPU socket lever and the metal load plate will be lifted as well.



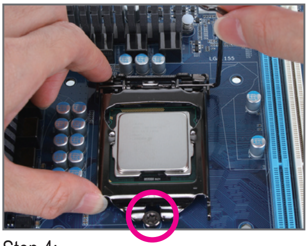
Step 2:

Remove the CPU socket cover as shown. Hold your index finger down on the rear grip of the socket cover and use your thumb to lift up the front edge (next to the "REMOVE" mark) and then remove the cover. (DO NOT touch socket contacts. To protect the CPU socket, always replace the protective socket cover when the CPU is not installed.)



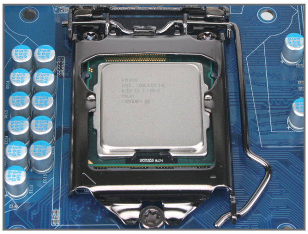
Step 3:

Hold the CPU with your thumb and index fingers. Align the CPU pin one marking (triangle) with the pin one corner of the CPU socket (or you may align the CPU notches with the socket alignment keys) and gently insert the CPU into position.



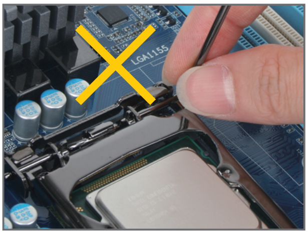
Step 4:

Once the CPU is properly inserted, use one hand to hold the socket lever and use the other to lightly replace the load plate. When replacing the load plate, make sure the front end of the load plate is under the shoulder screw.



Step 5:

Push the CPU socket lever back into its locked position.

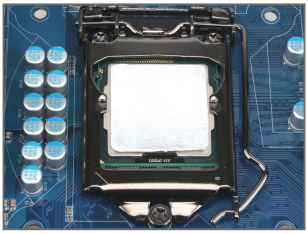


NOTE:

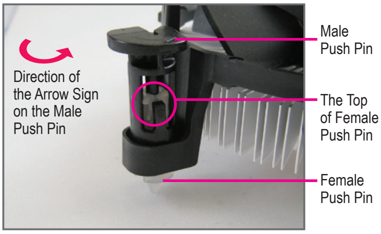
Hold the CPU socket lever by the handle, not the lever base portion.

1-3-2 Installing the CPU Cooler

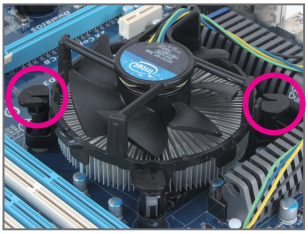
Follow the steps below to correctly install the CPU cooler on the motherboard. (The following procedure uses Intel® boxed cooler as the example cooler.)



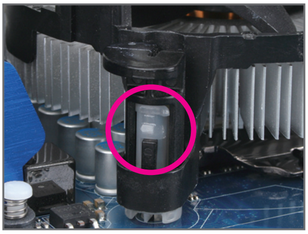
Step 1:
Apply an even and thin layer of thermal grease on the surface of the installed CPU.


Direction of the Arrow Sign on the Male Push Pin
Male Push Pin
The Top of Female Push Pin
Female Push Pin

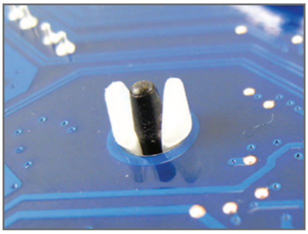
Step 2:
Before installing the cooler, note the direction of the arrow sign ↶ on the male push pin. (Turning the push pin along the direction of arrow is to remove the cooler, on the contrary, is to install.)



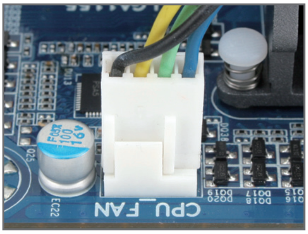
Step 3:
Place the cooler atop the CPU, aligning the four push pins through the pin holes on the motherboard. Push down on the push pins diagonally.



Step 4:
You should hear a "click" when pushing down each push pin. Check that the Male and Female push pins are joined closely. (Refer to your CPU cooler installation manual for instructions on installing the cooler.)



Step 5:
After the installation, check the back of the motherboard. If the push pin is inserted as the picture above shows, the installation is complete.



Step 6:
Finally, attach the power connector of the CPU cooler to the CPU fan header (CPU_FAN) on the motherboard.

Use extreme care when removing the CPU cooler because the thermal grease/tape between the CPU cooler and CPU may adhere to the CPU. Inadequately removing the CPU cooler may damage the CPU.

1-4 Installing the Memory

Read the following guidelines before you begin to install the memory:

- Make sure that the motherboard supports the memory. It is recommended that memory of the same capacity, brand, speed, and chips be used.
  (Go to GIGABYTE's website for the latest supported memory speeds and memory modules.)
- Always turn off the computer and unplug the power cord from the power outlet before installing the memory to prevent hardware damage.
- Memory modules have a foolproof design. A memory module can be installed in only one direction. If you are unable to insert the memory, switch the direction.

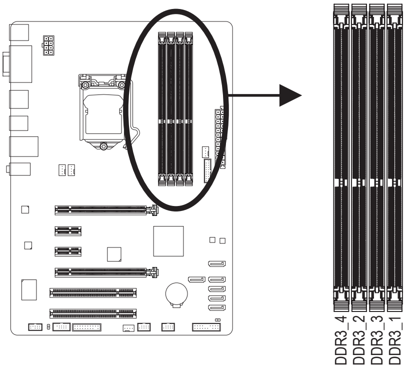
1-4-1 Dual Channel Memory Configuration

This motherboard provides four DDR3 memory sockets and supports Dual Channel Technology. After the memory is installed, the BIOS will automatically detect the specifications and capacity of the memory. Enabling Dual Channel memory mode will double the original memory bandwidth.

The four DDR3 memory sockets are divided into two channels and each channel has two memory sockets as following:

▸▸ Channel A: DDR3_2, DDR3_4

▸▸ Channel B: DDR3_1, DDR3_3



▸▸ Dual Channel Memory Configurations Table

	DDR3_4	DDR3_2	DDR3_3	DDR3_1
Two Modules	- -	DS/SS	- -	DS/SS
	DS/SS	- -	DS/SS	- -
Four Modules	DS/SS	DS/SS	DS/SS	DS/SS

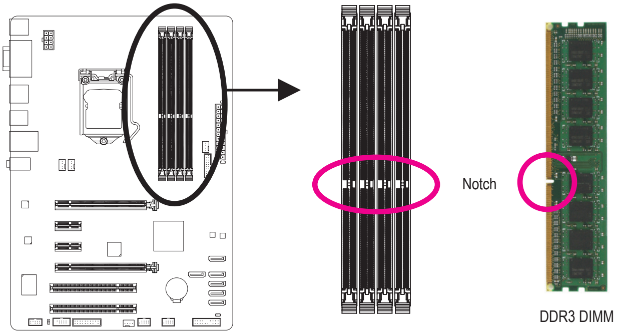
(SS=Single-Sided, DS=Double-Sided, "- -"=No Memory)

Due to CPU limitations, read the following guidelines before installing the memory in Dual Channel mode.

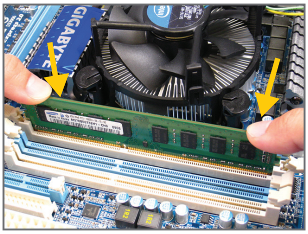
1. Dual Channel mode cannot be enabled if only one DDR3 memory module is installed.
2. When enabling Dual Channel mode with two or four memory modules, it is recommended that memory of the same capacity, brand, speed, and chips be used and installed in the same colored DDR3 sockets. For optimum performance, when enabling Dual Channel mode with two memory modules, we recommend that you install them in the DDR3_1 and DDR3_2 sockets.

1-4-2 Installing a Memory

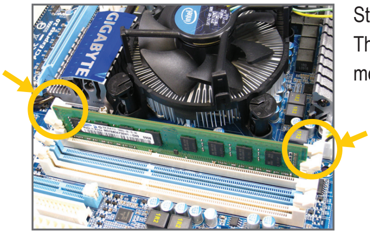
Before installing a memory module, make sure to turn off the computer and unplug the power cord from the power outlet to prevent damage to the memory module. DDR3 and DDR2 DIMMs are not compatible to each other or DDR DIMMs. Be sure to install DDR3 DIMMs on this motherboard.



A DDR3 memory module has a notch, so it can only fit in one direction. Follow the steps below to correctly install your memory modules in the memory sockets.



Step 1:
Note the orientation of the memory module. Spread the retaining clips at both ends of the memory socket. Place the memory module on the socket. As indicated in the picture on the left, place your fingers on the top edge of the memory, push down on the memory and insert it vertically into the memory socket.

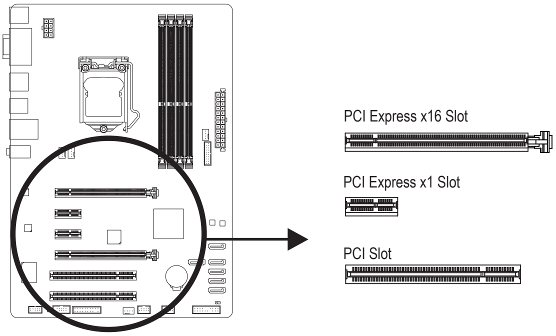


Step 2:
The clips at both ends of the socket will snap into place when the memory module is securely inserted.

1-5 Installing an Expansion Card

Read the following guidelines before you begin to install an expansion card:

- Make sure the motherboard supports the expansion card. Carefully read the manual that came with your expansion card.
- Always turn off the computer and unplug the power cord from the power outlet before installing an expansion card to prevent hardware damage.

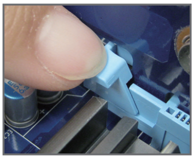


Follow the steps below to correctly install your expansion card in the expansion slot.

1. Locate an expansion slot that supports your card. Remove the metal slot cover from the chassis back panel.
2. Align the card with the slot, and press down on the card until it is fully seated in the slot.
3. Make sure the metal contacts on the card are completely inserted into the slot.
4. Secure the card's metal bracket to the chassis back panel with a screw.
5. After installing all expansion cards, replace the chassis cover(s).
6. Turn on your computer. If necessary, go to BIOS Setup to make any required BIOS changes for your expansion card(s).
7. Install the driver provided with the expansion card in your operating system.

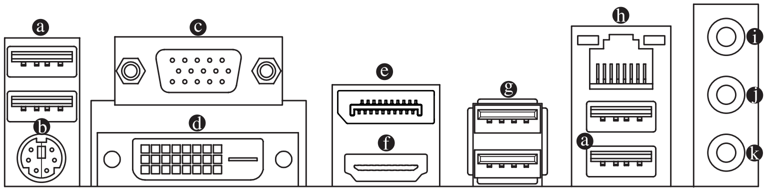
Example: Installing and Removing a PCI Express Graphics Card:

- Installing a Graphics Card:
  Gently push down on the top edge of the card until it is fully inserted into the PCI Express slot. Make sure the card is securely seated in the slot and does not rock.



- Removing the Card:
  Gently push back on the lever on the slot and then lift the card straight out from the slot.

1-6 Back Panel Connectors



ⓐ USB 2.0/1.1 Port

The USB port supports the USB 2.0/1.1 specification. Use this port for USB devices such as a USB keyboard/mouse, USB printer, USB flash drive and etc.

ⓑ PS/2 Keyboard/Mouse Port

Use this port to connect a PS/2 mouse or keyboard.

ⓒ D-Sub Port

The D-Sub port supports a 15-pin D-Sub connector. Connect a monitor that supports D-Sub connection to this port.

ⓓ DVI-D Port (Note)

The DVI-D port conforms to the DVI-D specification and supports a maximum resolution of 1920x1200 (the actual resolutions supported depend on the monitor being used). Connect a monitor that supports DVI-D connection to this port.

ⓔ DisplayPort

DisplayPort delivers high quality digital imaging and audio, supporting bi-directional audio transmission. DisplayPort can support both DPCP and HDCP content protection mechanisms. You can use this port to connect your DisplayPort-supported monitor. The DisplayPort Technology can support a maximum resolution of 2560x1600 but the actual resolutions supported depend on the monitor being used.

After installing the DisplayPort device, make sure to set the default sound playback device to DisplayPort. (Refer to the configuration steps for HDMI on the last page.)

ⓕ HDMI Port

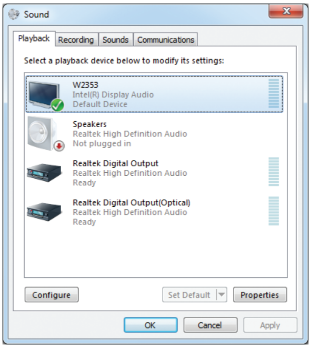
HDMI (High-Definition Multimedia Interface) is an all-digital audio/video interface capable of transmitting uncompressed audio/video signals. The HDMI port is HDCP compliant and supports Dolby True HD and DTS HD Master Audio formats. It also supports up to 192KHz/24bit 8-channel LPCM audio output. You can use this port to connect your HDMI-supported monitor. The maximum supported resolution is 1920x1200, but the actual resolutions supported are dependent on the monitor being used.

Dual Display Configurations for the Onboard Graphics:

This motherboard provides four video output ports: D-Sub, DVI-D, HDMI, and DisplayPort. Dual monitor confgurations are supported in operating system environment only, but not during the BIOS Setup or POST process.

(Note) The DVI-D port does not support D-Sub connection by adapter.

After installing the HDMI device, make sure to set the default sound playback device to HDMI. (The item name may differ depending on your operating system. The screenshot below is from Windows 7.)



Select a playback device below to modify its settings:

W2353
Intel(R) Display Audio
Default Device

Speakers
Realtek High Definition Audio
Not plugged in

Realtek Digital Output
Realtek High Definition Audio
Ready

Realtek Digital Output(Optical)
Realtek High Definition Audio
Ready

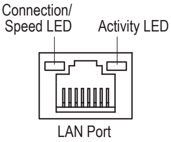
In Windows 7, select Start>Control Panel>Hardware and Sound>Sound>Playback, set Intel(R) Display Audio to the default playback device.

ⓖ USB 3.0/2.0 Port

The USB 3.0 port supports the USB 3.0 specification and is compatible to the USB 2.0/1.1 specification. Use this port for USB devices such as a USB keyboard/mouse, USB printer, USB flash drive and etc.

ⓗ RJ-45 LAN Port

The Gigabit Ethernet LAN port provides Internet connection at up to 1 Gbps data rate. The following describes the states of the LAN port LEDs.



Connection/Speed LED:

State	Description
Orange	1 Gbps data rate
Green	100 Mbps data rate
Off	10 Mbps data rate

Activity LED:

State	Description
Blinking	Data transmission or receiving is occurring
Off	No data transmission or receiving is occurring

ⓘ Line In Jack (Blue)

The default line in jack. Use this audio jack for line in devices such as an optical drive, walkman, etc.

ⓙ Line Out Jack (Green)

The default line out jack. Use this audio jack for a headphone or 2-channel speaker. This jack can be used to connect front speakers in a 4/5.1/7.1-channel audio configuration.

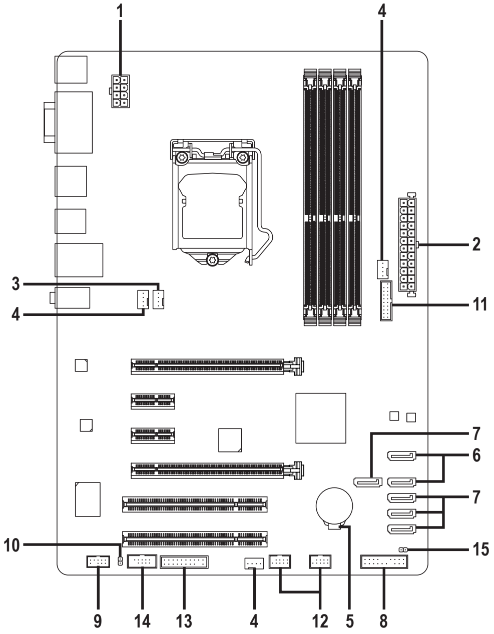
ⓚ Mic In Jack (Pink)

The default Mic in jack. Microphones must be connected to this jack.

To configure 7.1-channel audio, you have to use an HD front panel audio module and enable the multi-channel audio feature through the audio driver. Refer to the instructions on setting up a 2/4/5.1/7.1-channel audio configuration in Chapter 5, "Configuring 2/4/5.1/7.1-Channel Audio."

- When removing the cable connected to a back panel connector, first remove the cable from your device and then remove it from the motherboard.
- When removing the cable, pull it straight out from the connector. Do not rock it side to side to prevent an electrical short inside the cable connector.

1-7 Internal Connectors



1)	ATX_12V_2X4	9)	F_AUDIO
2)	ATX	10)	SPDIF_O
3)	CPU_FAN	11)	F_USB30
4)	SYS_FAN1/2/3	12)	F_USB1/F_USB2
5)	BAT	13)	TPM
6)	SATA3 0/1	14)	COMA
7)	SATA2 2/3/4/5	15)	CLR_CMOS
8)	F_PANEL		

Read the following guidelines before connecting external devices:

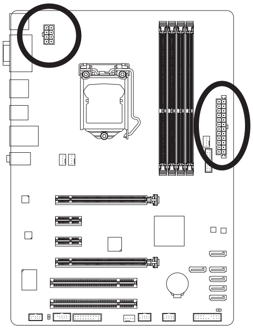
- First make sure your devices are compliant with the connectors you wish to connect.
- Before installing the devices, be sure to turn off the devices and your computer. Unplug the power cord from the power outlet to prevent damage to the devices.
- After installing the device and before turning on the computer, make sure the device cable has been securely attached to the connector on the motherboard.

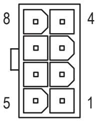
1/2) ATX_12V_2X4/ATX (2x4 12V Power Connector and 2x12 Main Power Connector)

With the use of the power connector, the power supply can supply enough stable power to all the components on the motherboard. Before connecting the power connector, first make sure the power supply is turned off and all devices are properly installed. The power connector possesses a foolproof design. Connect the power supply cable to the power connector in the correct orientation.

The 12V power connector mainly supplies power to the CPU. If the 12V power connector is not connected, the computer will not start.

To meet expansion requirements, it is recommended that a power supply that can withstand high power consumption be used (500W or greater). If a power supply is used that does not provide the required power, the result can lead to an unstable or unbootable system.

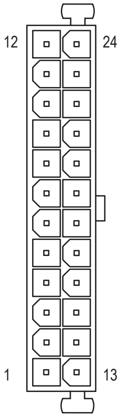




ATX_12V_2X4

ATX_12V_2X4:

Pin No.	Definition
1	GND (Only for 2x4-pin 12V)
2	GND (Only for 2x4-pin 12V)
3	GND
4	GND
5	+12V (Only for 2x4-pin 12V)
6	+12V (Only for 2x4-pin 12V)
7	+12V
8	+12V



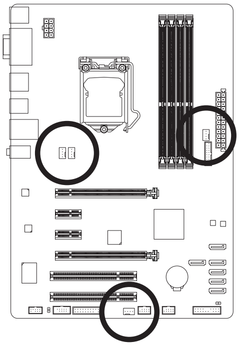
ATX

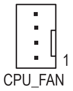
ATX:

Pin No.	Definition	Pin No.	Definition
1	3.3V	13	3.3V
2	3.3V	14	-12V
3	GND	15	GND
4	+5V	16	PS_ON (soft On/Off)
5	GND	17	GND
6	+5V	18	GND
7	GND	19	GND
8	Power Good	20	-5V
9	5VSB (stand by +5V)	21	+5V
10	+12V	22	+5V
11	+12V (Only for 2x12-pin ATX)	23	+5V (Only for 2x12-pin ATX)
12	3.3V (Only for 2x12-pin ATX)	24	GND (Only for 2x12-pin ATX)

3/4) CPU_FAN/SYS_FAN1/SYS_FAN2/SYS_FAN3 (Fan Headers)

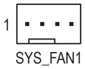
All fan headers on this motherboard are 4-pin. Most fan headers possess a foolproof insertion design. When connecting a fan cable, be sure to connect it in the correct orientation (the black connector wire is the ground wire). The speed control function requires the use of a fan with fan speed control design. For optimum heat dissipation, it is recommended that a system fan be installed inside the chassis.





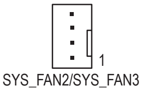
CPU_FAN:

Pin No.	Definition
1	GND
2	+12V /Speed Control
3	Sense
4	Speed Control



SYS_FAN1:

Pin No.	Definition
1	GND
2	+12V /Speed Control
3	Sense
4	VCC



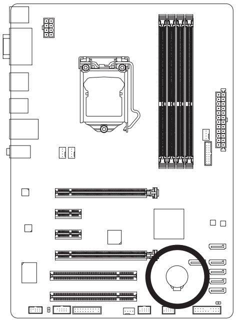
SYS_FAN2/SYS_FAN3:

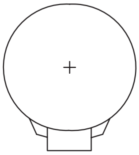
Pin No.	Definition
1	GND
2	+12V
3	Sense
4	Speed Control

- Be sure to connect fan cables to the fan headers to prevent your CPU and system from overheating. Overheating may result in damage to the CPU or the system may hang.
- These fan headers are not configuration jumper blocks. Do not place a jumper cap on the headers.

5) BAT (Battery)

The battery provides power to keep the values (such as BIOS configurations, date, and time information) in the CMOS when the computer is turned off. Replace the battery when the battery voltage drops to a low level, or the CMOS values may not be accurate or may be lost.





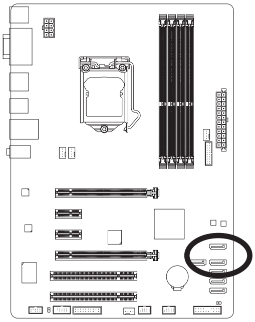
You may clear the CMOS values by removing the battery:

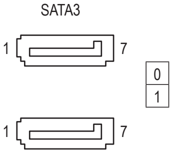
1. Turn off your computer and unplug the power cord.
2. Gently remove the battery from the battery holder and wait for one minute. (Or use a metal object like a screwdriver to touch the positive and negative terminals of the battery holder, making them short for 5 seconds.)
3. Replace the battery.
4. Plug in the power cord and restart your computer.

- Always turn off your computer and unplug the power cord before replacing the battery.
- Replace the battery with an equivalent one. Danger of explosion if the battery is replaced with an incorrect model.
- Contact the place of purchase or local dealer if you are not able to replace the battery by yourself or uncertain about the battery model.
- When installing the battery, note the orientation of the positive side (+) and the negative side (-) of the battery (the positive side should face up).
- Used batteries must be handled in accordance with local environmental regulations.

6) SATA3 0/1 (SATA 6Gb/s Connectors, Controlled by Intel Z77 Chipset)

The SATA connectors conform to SATA 6Gb/s standard and are compatible with SATA 3Gb/s and SATA 1.5Gb/s standard. Each SATA connector supports a single SATA device. The SATA3 0/1 connectors support RAID 0 and RAID 1. RAID 5 and RAID 10 can be implemented on the two connectors with the SATA2 2/3/4/5 connector (Note). Refer to Chapter 5, "Configuring SATA Hard Drive(s)," for instructions on configuring a RAID array.

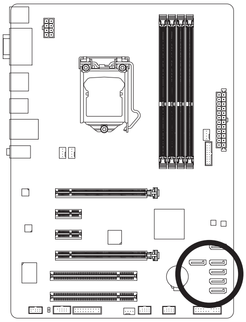


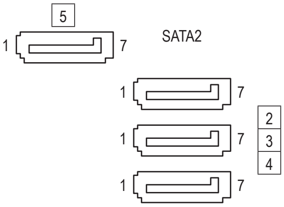


Pin No.	Definition
1	GND
2	TXP
3	TXN
4	GND
5	RXN
6	RXP
7	GND

7) SATA2 2/3/4/5 (SATA 3Gb/s Connectors, Controlled by Intel Z77 Chipset)

The SATA connectors conform to SATA 3Gb/s standard and are compatible with SATA 1.5Gb/s standard. Each SATA connector supports a single SATA device. The Intel Z77 Chipset supports RAID 0, RAID 1, RAID 5, and RAID 10. Refer to Chapter 5, "Configuring SATA Hard Drive(s)," for instructions on configuring a RAID array.





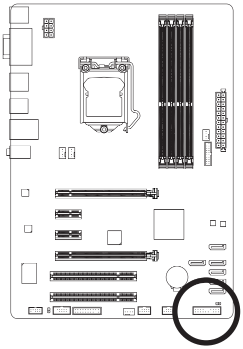
Pin No.	Definition
1	GND
2	TXP
3	TXN
4	GND
5	RXN
6	RXP
7	GND

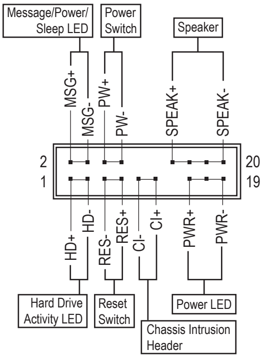
- A RAID 0 or RAID 1 configuration requires at least two hard drives. If more than two hard drives are to be used, the total number of hard drives must be an even number.
- A RAID 5 configuration requires at least three hard drives. (The total number of hard drives does not have to be an even number.)
- A RAID 10 configuration requires four hard drives.

(Note) When a RAID set is built across the SATA 6Gb/s and SATA 3Gb/s channels, the system performance of the RAID set may vary depending on the devices being connected.

8) F_PANEL (Front Panel Header)

Connect the power switch, reset switch, speaker, chassis intrusion switch/sensor and system status indicator on the chassis to this header according to the pin assignments below. Note the positive and negative pins before connecting the cables.





- **MSG/PWR** (Message/Power/Sleep LED, Yellow/Purple):

System Status	LED
S0	On
S3/S4/S5	Off

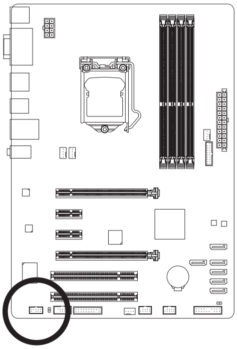
Connects to the power status indicator on the chassis front panel. The LED is on when the system is operating. The LED is off when the system is in S3/S4 sleep state or powered off (S5).

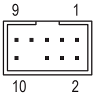
- **PW** (Power Switch, Red):
  Connects to the power switch on the chassis front panel. You may configure the way to turn off your system using the power switch (refer to Chapter 2, "BIOS Setup," "Power Management," for more information).
- **SPEAK** (Speaker, Orange):
  Connects to the speaker on the chassis front panel. The system reports system startup status by issuing a beep code. One single short beep will be heard if no problem is detected at system startup.
- **HD** (Hard Drive Activity LED, Blue):
  Connects to the hard drive activity LED on the chassis front panel. The LED is on when the hard drive is reading or writing data.
- **RES** (Reset Switch, Green):
  Connects to the reset switch on the chassis front panel. Press the reset switch to restart the computer if the computer freezes and fails to perform a normal restart.
- **CI** (Chassis Intrusion Header, Gray):
  Connects to the chassis intrusion switch/sensor on the chassis that can detect if the chassis cover has been removed. This function requires a chassis with a chassis intrusion switch/sensor.

The front panel design may differ by chassis. A front panel module mainly consists of power switch, reset switch, power LED, hard drive activity LED, speaker and etc. When connecting your chassis front panel module to this header, make sure the wire assignments and the pin assignments are matched correctly.

9) F_AUDIO (Front Panel Audio Header)

The front panel audio header supports Intel High Definition audio (HD) and AC'97 audio. You may connect your chassis front panel audio module to this header. Make sure the wire assignments of the module connector match the pin assignments of the motherboard header. Incorrect connection between the module connector and the motherboard header will make the device unable to work or even damage it.





For HD Front Panel Audio:

Pin No.	Definition
1	MIC2_L
2	GND
3	MIC2_R
4	-ACZ_DET
5	LINE2_R
6	GND
7	FAUDIO_JD
8	No Pin
9	LINE2_L
10	GND

For AC'97 Front Panel Audio:

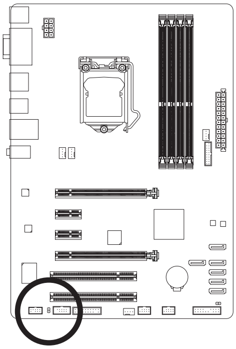
Pin No.	Definition
1	MIC
2	GND
3	MIC Power
4	NC
5	Line Out (R)
6	NC
7	NC
8	No Pin
9	Line Out (L)
10	NC

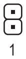
- The front panel audio header supports HD audio by default. If your chassis provides an AC'97 front panel audio module, refer to the instructions on how to activate AC'97 functionality via the audio software in Chapter 5, "Configuring 2/4/5.1/7.1-Channel Audio."
- Audio signals will be present on both of the front and back panel audio connections simultaneously. If you want to mute the back panel audio (only supported when using an HD front panel audio module), refer to Chapter 5, "Configuring 2/4/5.1/7.1-Channel Audio."
- Some chassis provide a front panel audio module that has separated connectors on each wire instead of a single plug. For information about connecting the front panel audio module that has different wire assignments, please contact the chassis manufacturer.

10) SPDIF_O (S/PDIF Out Header)

This header supports digital S/PDIF Out and connects a S/PDIF digital audio cable (provided by expansion cards) for digital audio output from your motherboard to certain expansion cards like graphics cards and sound cards. For example, some graphics cards may require you to use a S/PDIF digital audio cable for digital audio output from your motherboard to your graphics card if you wish to connect an HDMI display to the graphics card and have digital audio output from the HDMI display at the same time.

For information about connecting the S/PDIF digital audio cable, carefully read the manual for your expansion card.

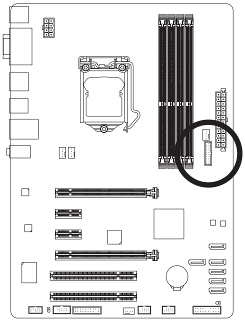


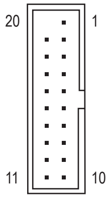


Pin No.	Definition
1	SPDIFO
2	GND

11) F_USB30 (USB 3.0/2.0 Header)

The header conforms to USB 3.0/2.0 specification and can provide two USB ports. For purchasing the optional 3.5" front panel that provides two USB 3.0/2.0 ports, please contact the local dealer.

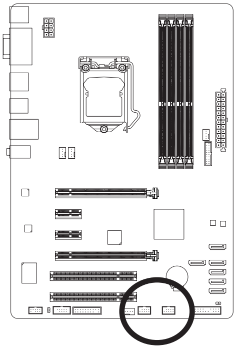


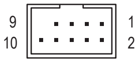


Pin No.	Definition	Pin No.	Definition
1	VBUS	11	D2+
2	SSRX1-	12	D2-
3	SSRX1+	13	GND
4	GND	14	SSTX2+
5	SSTX1-	15	SSTX2-
6	SSTX1+	16	GND
7	GND	17	SSRX2+
8	D1-	18	SSRX2-
9	D1+	19	VBUS
10	NC	20	No Pin

12) F_USB1/F_USB2 (USB 2.0/1.1 Headers)

The headers conform to USB 2.0/1.1 specification. Each USB header can provide two USB ports via an optional USB bracket. For purchasing the optional USB bracket, please contact the local dealer.



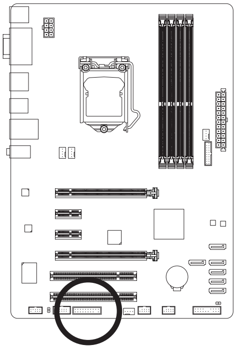


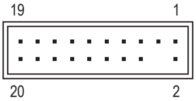
Pin No.	Definition
1	Power (5V)
2	Power (5V)
3	USB DX-
4	USB DY-
5	USB DX+
6	USB DY+
7	GND
8	GND
9	No Pin
10	NC

- Do not plug the IEEE 1394 bracket (2x5-pin) cable into the USB 2.0/1.1 header.
- Prior to installing the USB bracket, be sure to turn off your computer and unplug the power cord from the power outlet to prevent damage to the USB bracket.

13) TPM (Trusted Platform Module Header)

You may connect a TPM (Trusted Platform Module) to this header.

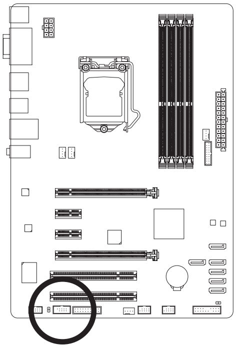


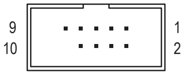


Pin No.	Definition	Pin No.	Definition
1	LCLK	11	LAD0
2	GND	12	GND
3	LFRAME	13	NC
4	No Pin	14	ID
5	LRESET	15	SB3V
6	NC	16	SERIRQ
7	LAD3	17	GND
8	LAD2	18	NC
9	VCC3	19	NC
10	LAD1	20	SUSCLK

14) COMA (Serial Port Header)

The COM header can provide one serial port via an optional COM port cable. For purchasing the optional COM port cable, please contact the local dealer.

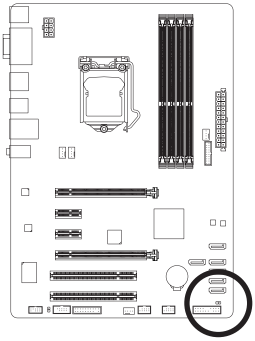




Pin No.	Definition
1	NDCD-
2	NSIN
3	NSOUT
4	NDTR-
5	GND
6	NDSR-
7	NRTS-
8	NCTS-
9	NRI-
10	No Pin

15) CLR_CMOS (Clear CMOS Jumper)

Use this jumper to clear the CMOS values (e.g. date information and BIOS configurations) and reset the CMOS values to factory defaults. To clear the CMOS values, use a metal object like a screwdriver to touch the two pins for a few seconds.



Open: Normal

Short: Clear CMOS Values

- Always turn off your computer and unplug the power cord from the power outlet before clearing the CMOS values.
- After system restart, go to BIOS Setup to load factory defaults (select Load Optimized Defaults) or manually configure the BIOS settings (refer to Chapter 2, "BIOS Setup," for BIOS configurations).

Chapter 2 BIOS Setup

BIOS (Basic Input and Output System) records hardware parameters of the system in the CMOS on the motherboard. Its major functions include conducting the Power-On Self-Test (POST) during system startup, saving system parameters and loading operating system, etc. BIOS includes a BIOS Setup program that allows the user to modify basic system configuration settings or to activate certain system features.

When the power is turned off, the battery on the motherboard supplies the necessary power to the CMOS to keep the configuration values in the CMOS.

To access the BIOS Setup program, press the <Delete> key during the POST when the power is turned on.

To upgrade the BIOS, use either the GIGABYTE Q-Flash or @BIOS utility.

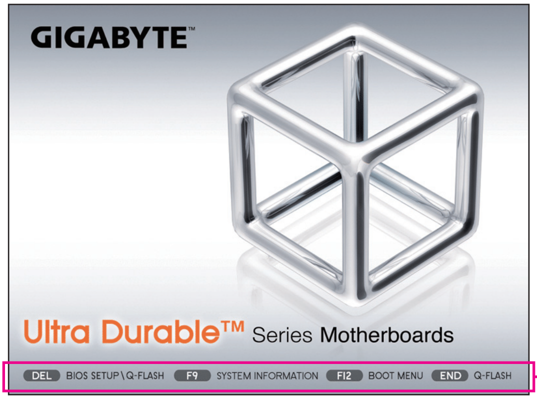
- Q-Flash allows the user to quickly and easily upgrade or back up BIOS without entering the operating system.
- @BIOS is a Windows-based utility that searches and downloads the latest version of BIOS from the Internet and updates the BIOS.

For instructions on using the Q-Flash and @BIOS utilities, refer to Chapter 4, "BIOS Update Utilities."

- Because BIOS flashing is potentially risky, if you do not encounter problems using the current version of BIOS, it is recommended that you not flash the BIOS. To flash the BIOS, do it with caution. Inadequate BIOS flashing may result in system malfunction.
- It is recommended that you not alter the default settings (unless you need to) to prevent system instability or other unexpected results. Inadequately altering the settings may result in system's failure to boot. If this occurs, try to clear the CMOS values and reset the board to default values. (Refer to the "Load Optimized Defaults" section in this chapter or introductions of the battery/clear CMOS jumper in Chapter 1 for how to clear the CMOS values.)

2-1 Startup Screen

The following startup Logo screen will appear when the computer boots.


GIGABYTE™
Ultra Durable™ Series Motherboards
DEL BIOS SETUP\Q-FLASH
F9 SYSTEM INFORMATION
F12 BOOT MENU
END Q-FLASH

Function Keys

Function Keys:

<DEL>: BIOS SETUP\Q-FLASH

Press the <Delete> key to enter BIOS Setup or to access the Q-Flash utility in BIOS Setup.

<F9>: SYSTEM INFORMATION

Press the <F9> key to display your system information.

<F12>: BOOT MENU

Boot Menu allows you to set the first boot device without entering BIOS Setup. In Boot Menu, use the up arrow key <↑> or the down arrow key <↓> to select the first boot device, then press <Enter> to accept. The system will boot from the device immediately.

Note: The setting in Boot Menu is effective for one time only. After system restart, the device boot order will still be based on BIOS Setup settings.

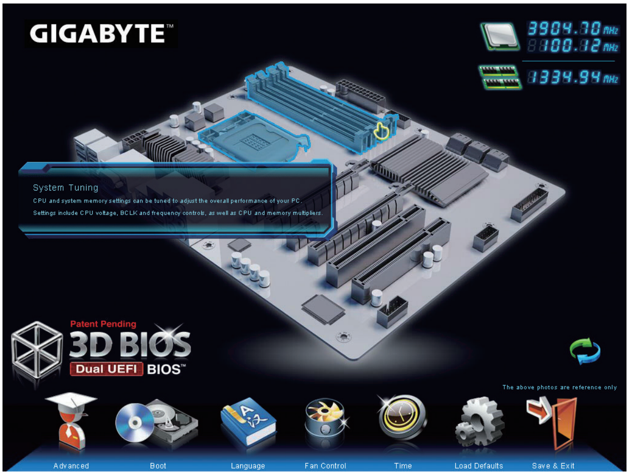
<END>: Q-FLASH

Press the <End> key to access the Q-Flash utility directly without having to enter BIOS Setup first.

2-2 The Main Menu

A. The 3D BIOS Screen (Default)

On GIGABYTE's uniquely designed 3D BIOS screen, you can use your mouse to move through the motherboard image and click to enter the function menu in each area for quick configuration. For example, pass your mouse arrow over the CPU and memory sockets and enter the **System Tuning** menu to configure CPU/memory frequency, memory timings, and voltage settings. For more detailed configuration items, you can click the function menu icons at the bottom of the screen or press <F1> to switch to the main menu of the BIOS Setup program. (If a mouse is not connected, the 3D BIOS screen will automatically switch to the main menu of the BIOS Setup Program.)


GIGABYTE™
3904.70 MHz
100.12 MHz
1334.94 MHz
Patent Pending
3D BIOS
Dual UEFI BIOS™
The above photos are reference only
Advanced
Boot
Language
Fan Control
Time
Load Defaults
Save & Exit

System Tuning

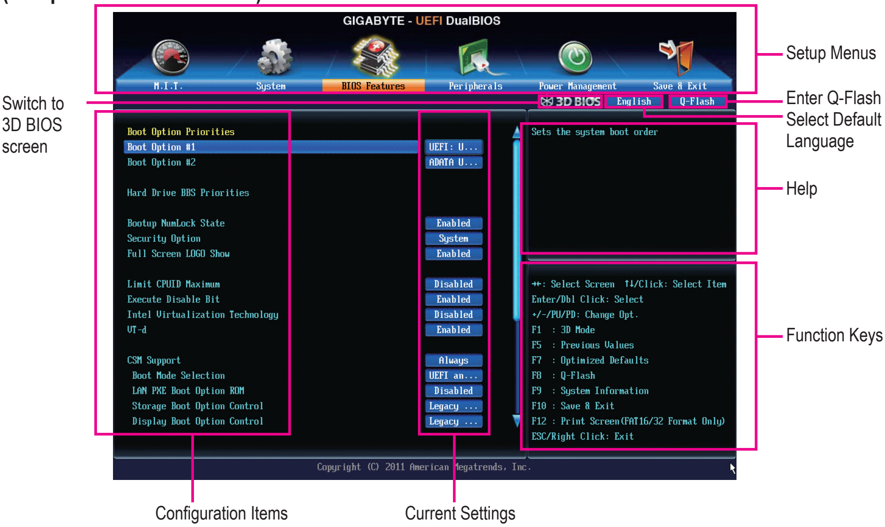
CPU and system memory settings can be tuned to adjust the overall performance of your PC.

Settings include CPU voltage, BCLK and frequency controls, as well as CPU and memory multipliers.

B. The Main Menu of the BIOS Setup Program

On the main menu of the BIOS Setup program, press arrow keys to move among the items and press <Enter> to accept or enter a sub-menu. Or you can use your mouse to select the item you want.

(Sample BIOS Version: F1b)


GIGABYTE - UEFI DualBIOS
M.I.T.
System
BIOS Features
Peripherals
Power Management
Save & Exit
3D BIOS
English
Q-Flash
Setup Menus
Switch to 3D BIOS screen
Enter Q-Flash
Select Default Language
Help
Function Keys
Configuration Items
Current Settings
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```
Boot Option Priorities
Boot Option #1                        UEFI: U...
Boot Option #2                        ADATA U...

Hard Drive BBS Priorities

Bootup NumLock State                  Enabled
Security Option                       System
Full Screen LOGO Show                 Enabled

Limit CPUID Maximum                   Disabled
Execute Disable Bit                   Enabled
Intel Virtualization Technology       Disabled
VT-d                                  Enabled

CSM Support                           Always
 Boot Mode Selection                  UEFI an...
 LAN PXE Boot Option ROM              Disabled
 Storage Boot Option Control          Legacy ...
 Display Boot Option Control          Legacy ...
```

```
Sets the system boot order
```

```
→←: Select Screen  ↑↓/Click: Select Item
Enter/Dbl Click: Select
+/-/PU/PD: Change Opt.
F1  : 3D Mode
F5  : Previous Values
F7  : Optimized Defaults
F8  : Q-Flash
F9  : System Information
F10 : Save & Exit
F12 : Print Screen(FAT16/32 Format Only)
ESC/Right Click: Exit
```

BIOS Setup Program Function Keys

<←><→>	Move the selection bar to select a setup menu
<↑><↓>	Move the selection bar to select an configuration item on a menu
<Enter>	Execute command or enter a menu
<+>/<Page Up>	Increase the numeric value or make changes
<->/<Page Down>	Decrease the numeric value or make changes
<F1>	Switch to 3D BIOS screen
<F5>	Restore the previous BIOS settings for the current submenus
<F7>	Load the Optimized BIOS default settings for the current submenus
<F8>	Access the Q-Flash utility
<F9>	Display system information
<F10>	Save all the changes and exit the BIOS Setup program
<F12>	Capture the current screen as an image and save it to your USB drive
<Esc>	Main Menu: Exit the BIOS Setup program Submenus: Exit current submenu

BIOS Setup Menus

■ M.I.T.

Use this menu to configure the clock, frequency, and voltages of your CPU and memory, etc. Or check the system/CPU temperatures, voltages, and fan speeds.

■ System

Use this menu to configure the default language used by the BIOS and system time and date. This menu also displays information on the devices connected to the SATA ports.

■ BIOS Features

Use this menu to configure the device boot order, advanced features available on the CPU, and the primary display adapter.

■ Peripherals

Use this menu to configure all peripheral devices, such as SATA, USB, integrated audio, and integrated LAN, etc.

■ Power Management

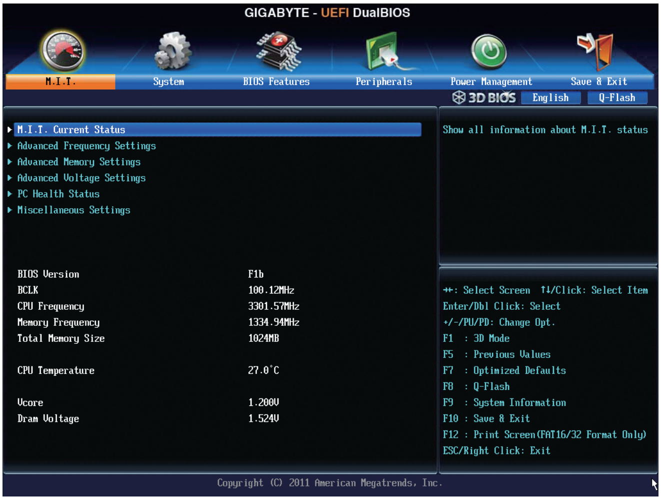
Use this menu to configure all the power-saving functions.

■ Save & Exit

Save all the changes made in the BIOS Setup program to the CMOS and exit BIOS Setup. You can save the current BIOS settings to a profile or load optimized defaults for optimal-performance system operations.

- When the system is not stable as usual, select the **Load Optimized Defaults** item to set your system to its defaults.
- The BIOS Setup menus described in this chapter are for reference only and may differ by BIOS version.

2-3 M.I.T.


GIGABYTE - UEFI DualBIOS
M.I.T.
System
BIOS Features
Peripherals
Power Management
Save & Exit
3D BIOS
English
Q-Flash
M.I.T. Current Status
Advanced Frequency Settings
Advanced Memory Settings
Advanced Voltage Settings
PC Health Status
Miscellaneous Settings

```
BIOS Version                  F1b
BCLK                          100.12MHz
CPU Frequency                 3301.57MHz
Memory Frequency              1334.94MHz
Total Memory Size             1024MB

CPU Temperature               27.0°C

Vcore                         1.200V
Dram Voltage                  1.524V
```

Show all information about M.I.T. status

```
→←: Select Screen  ↑↓/Click: Select Item
Enter/Dbl Click: Select
+/-/PU/PD: Change Opt.
F1  : 3D Mode
F5  : Previous Values
F7  : Optimized Defaults
F8  : Q-Flash
F9  : System Information
F10 : Save & Exit
F12 : Print Screen(FAT16/32 Format Only)
ESC/Right Click: Exit
```

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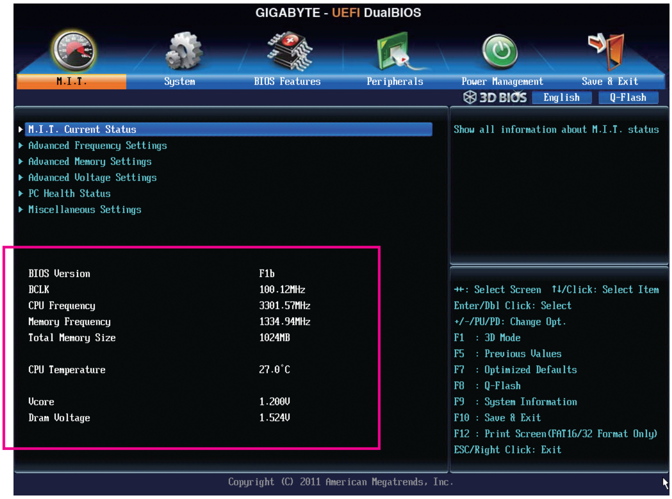
Whether the system will work stably with the overclock/overvoltage settings you made is dependent on your overall system configurations. Incorrectly doing overclock/overvoltage may result in damage to CPU, chipset, or memory and reduce the useful life of these components. This page is for advanced users only and we recommend you not to alter the default settings to prevent system instability or other unexpected results. (Inadequately altering the settings may result in system's failure to boot. If this occurs, clear the CMOS values and reset the board to default values.)


GIGABYTE - UEFI DualBIOS
M.I.T.
System
BIOS Features
Peripherals
Power Management
Save & Exit
3D BIOS
English
Q-Flash
M.I.T. Current Status
Advanced Frequency Settings
Advanced Memory Settings
Advanced Voltage Settings
PC Health Status
Miscellaneous Settings

BIOS Version F1b
BCLK 100.12MHz
CPU Frequency 3301.57MHz
Memory Frequency 1334.94MHz
Total Memory Size 1024MB
CPU Temperature 27.0°C
Vcore 1.200V
Dram Voltage 1.524V
Show all information about M.I.T. status
→←: Select Screen ↑↓/Click: Select Item
Enter/Dbl Click: Select
+/-/PU/PD: Change Opt.
F1 : 3D Mode
F5 : Previous Values
F7 : Optimized Defaults
F8 : Q-Flash
F9 : System Information
F10 : Save & Exit
F12 : Print Screen(FAT16/32 Format Only)
ESC/Right Click: Exit
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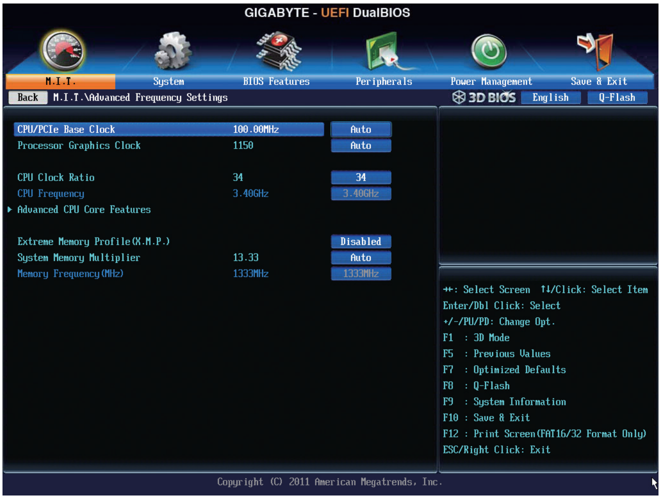
This section provides information on the BIOS version, CPU base clock, CPU frequency, memory frequency, total memory size, CPU temperature, Vcore, and memory voltage.

M.I.T. Current Status

This screen provides information on CPU/memory frequencies/parameters.

Advanced Frequency Settings


GIGABYTE - UEFI DualBIOS
M.I.T.
System
BIOS Features
Peripherals
Power Management
Save & Exit
Back
M.I.T.\Advanced Frequency Settings
3D BIOS
English
Q-Flash

```
CPU/PCIe Base Clock              100.00MHz      Auto
Processor Graphics Clock         1150           Auto

CPU Clock Ratio                  34             34
CPU Frequency                    3.40GHz        3.40GHz
▸ Advanced CPU Core Features

Extreme Memory Profile(X.M.P.)                  Disabled
System Memory Multiplier         13.33          Auto
Memory Frequency(MHz)            1333MHz        1333MHz
```

```
→←: Select Screen  ↑↓/Click: Select Item
Enter/Dbl Click: Select
+/-/PU/PD: Change Opt.
F1  : 3D Mode
F5  : Previous Values
F7  : Optimized Defaults
F8  : Q-Flash
F9  : System Information
F10 : Save & Exit
F12 : Print Screen(FAT16/32 Format Only)
ESC/Right Click: Exit
```

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CPU/PCIe Base Clock

Allows you to manually set the CPU base clock and PCIe bus frequency in 0.01 MHz increments. (Default: Auto)

Important: It is highly recommended that the CPU frequency be set in accordance with the CPU specifications.

Processor Graphics Clock

Allows you to set the onboard graphics clock. The adjustable range is from 400 MHz to 1600 MHz. (Default: Auto)

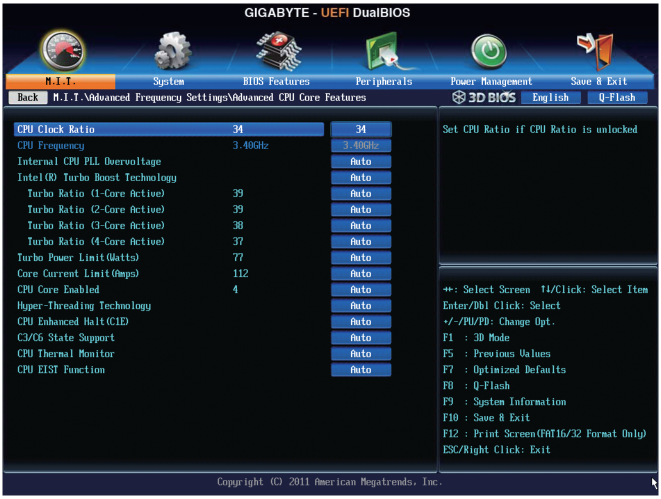
CPU Clock Ratio

Allows you to alter the clock ratio for the installed CPU. The adjustable range is dependent on the CPU being installed.

CPU Frequency

Displays the current operating CPU frequency.

Advanced CPU Core Features



```
CPU Clock Ratio                        34        34
CPU Frequency                          3.40GHz   3.40GHz
Internal CPU PLL Overvoltage                     Auto
Intel(R) Turbo Boost Technology                  Auto
  Turbo Ratio (1-Core Active)          39        Auto
  Turbo Ratio (2-Core Active)          39        Auto
  Turbo Ratio (3-Core Active)          38        Auto
  Turbo Ratio (4-Core Active)          37        Auto
Turbo Power Limit(Watts)               77        Auto
Core Current Limit(Amps)               112       Auto
CPU Core Enabled                       4         Auto
Hyper-Threading Technology                       Auto
CPU Enhanced Halt(C1E)                           Auto
C3/C6 State Support                              Auto
CPU Thermal Monitor                              Auto
CPU EIST Function                                Auto
```

```
Set CPU Ratio if CPU Ratio is unlocked
```

```
→←: Select Screen  ↑↓/Click: Select Item
Enter/Dbl Click: Select
+/-/PU/PD: Change Opt.
F1  : 3D Mode
F5  : Previous Values
F7  : Optimized Defaults
F8  : Q-Flash
F9  : System Information
F10 : Save & Exit
F12 : Print Screen(FAT16/32 Format Only)
ESC/Right Click: Exit
```

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CPU Clock Ratio, CPU Frequency

The settings above are synchronous to those under the same items on the **Advanced Frequency Settings** menu.

Internal CPU PLL Overvoltage

Enabled allows CPU PLL voltage to operate at a higher value. **Disabled** allows CPU PLL voltage to operate at default value. **Auto** lets the BIOS automatically configure this setting. (Default: Auto)

Intel(R) Turbo Boost Technology (Note)

Allows you to determine whether to enable the Intel CPU Turbo Boost technology. **Auto** lets the BIOS automatically configure this setting. (Default: Auto)

Turbo Ratio (1-Core Active~4-Core Active) (Note)

Allows you to set the CPU Turbo ratios for different number of active cores. **Auto** sets the CPU Turbo ratios according to the CPU specifications. (Default: Auto)

Turbo Power Limit (Watts)

Allows you to set a power limit for CPU Turbo mode. When the CPU power consumption exceeds the specified power limit, the CPU will automatically reduce the core frequency in order to reduce the power. **Auto** sets the power limit according to the CPU specifications. (Default: Auto)

Core Current Limit (Amps)

Allows you to set a current limit for CPU Turbo mode. When the CPU current exceeds the specified current limit, the CPU will automatically reduce the core frequency in order to reduce the current. **Auto** sets the power limit according to the CPU specifications. (Default: Auto)

CPU Core Enabled (Note)

Allows you to determine whether to enable all CPU cores. **Auto** lets the BIOS automatically configure this setting. (Default: Auto)

(Note) This item is present only when you install a CPU that supports this feature. For more information about Intel CPUs' unique features, please visit Intel's website.

☞ Hyper-Threading Technology (Note 1)

Allows you to determine whether to enable multi-threading technology when using an Intel CPU that supports this function. This feature only works for operating systems that support multi-processor mode. **Auto** lets the BIOS automatically configure this setting. (Default: Auto)

☞ CPU Enhanced Halt (C1E) (Note 1)

Enables or disables Intel CPU Enhanced Halt (C1E) function, a CPU power-saving function in system halt state. When enabled, the CPU core frequency and voltage will be reduced during system halt state to decrease power consumption. **Auto** lets the BIOS automatically configure this setting. (Default: Auto)

☞ C3/C6 State Support (Note 1)

Allows you to determine whether to let the CPU enter C3/C6 mode in system halt state. When enabled, the CPU core frequency and voltage will be reduced during system halt state to decrease power consumption. The C3/C6 state is a more enhanced power-saving state than C1. **Auto** lets the BIOS automatically configure this setting. (Default: Auto)

☞ CPU Thermal Monitor (Note 1)

Enables or disables Intel CPU Thermal Monitor function, a CPU overheating protection function. When enabled, the CPU core frequency and voltage will be reduced when the CPU is overheated. **Auto** lets the BIOS automatically configure this setting. (Default: Auto)

☞ CPU EIST Function (Note 1)

Enables or disables Enhanced Intel SpeedStep Technology (EIST). Depending on CPU loading, Intel EIST technology can dynamically and effectively lower the CPU voltage and core frequency to decrease average power consumption and heat production. **Auto** lets the BIOS automatically configure this setting. (Default: Auto)

☞ Extreme Memory Profile (X.M.P.) (Note 2)

Allows the BIOS to read the SPD data on XMP memory module(s) to enhance memory performance when enabled.

▸▸ Disabled	Disables this function. (Default)
▸▸ Profile1	Uses Profile 1 settings.
▸▸ Profile2 (Note 2)	Uses Profile 2 settings.

☞ System Memory Multiplier

Allows you to set the system memory multiplier. **Auto** sets memory multiplier according to memory SPD data. (Default: Auto)

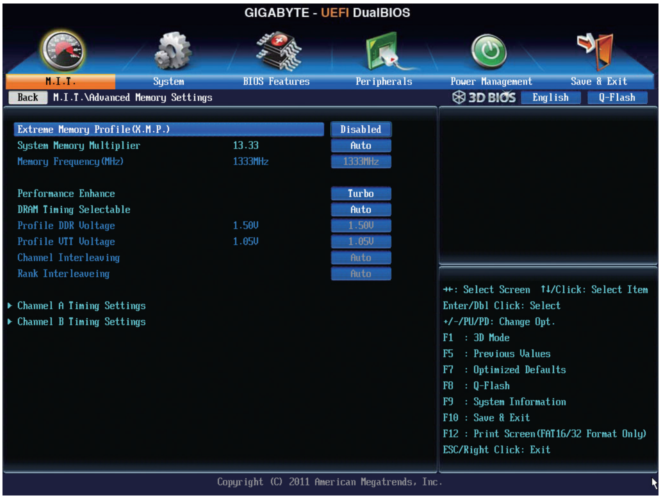
☞ Memory Frequency (MHz)

The first memory frequency value is the normal operating frequency of the memory being used; the second is the memory frequency that is automatically adjusted according to the **System Memory Multiplier** settings.

(Note 1) This item is present only when you install a CPU that supports this feature. For more information about Intel CPUs' unique features, please visit Intel's website.

(Note 2) This item is present only when you install a CPU and a memory module that support this feature.

Advanced Memory Settings



```
M.I.T.\Advanced Memory Settings

Extreme Memory Profile(X.M.P.)                  Disabled
System Memory Multiplier        13.33           Auto
Memory Frequency(MHz)           1333MHz         1333MHz

Performance Enhance                             Turbo
DRAM Timing Selectable                          Auto
Profile DDR Voltage             1.50V           1.50V
Profile VTT Voltage             1.05V           1.05V
Channel Interleaving                            Auto
Rank Interleaveing                              Auto

▸ Channel A Timing Settings
▸ Channel B Timing Settings

→←: Select Screen  ↑↓/Click: Select Item
Enter/Dbl Click: Select
+/-/PU/PD: Change Opt.
F1  : 3D Mode
F5  : Previous Values
F7  : Optimized Defaults
F8  : Q-Flash
F9  : System Information
F10 : Save & Exit
F12 : Print Screen(FAT16/32 Format Only)
ESC/Right Click: Exit

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```

Extreme Memory Profile (X.M.P.) (Note), System Memory Multiplier, Memory Frequency(Mhz)

The settings above are synchronous to those under the same items on the **Advanced Frequency Settings** menu.

Performance Enhance

Allows the system to operate at three different performance levels.

▸▸ Normal	Lets the system operate at its basic performance level.
▸▸ Turbo	Lets the system operate at its good performance level. (Default)
▸▸ Extreme	Lets the system operate at its best performance level.

DRAM Timing Selectable

Quick and **Expert** allows the **Channel Interleaving**, **Rank Interleaving**, and memory timing settings below to be configurable. Options are: Auto (default), Quick, Expert.

Profile DDR Voltage

When using a non-XMP memory module or **Extreme Memory Profile (X.M.P.)** is set to **Disabled**, this item will display as **1.50V**. When **Extreme Memory Profile (X.M.P.)** is set to **Profile1** or **Profile2**, this item will display the value based on the SPD data on the XMP memory.

Profile VTT Voltage

The value displayed here is dependent on the CPU being used.

Channel Interleaving

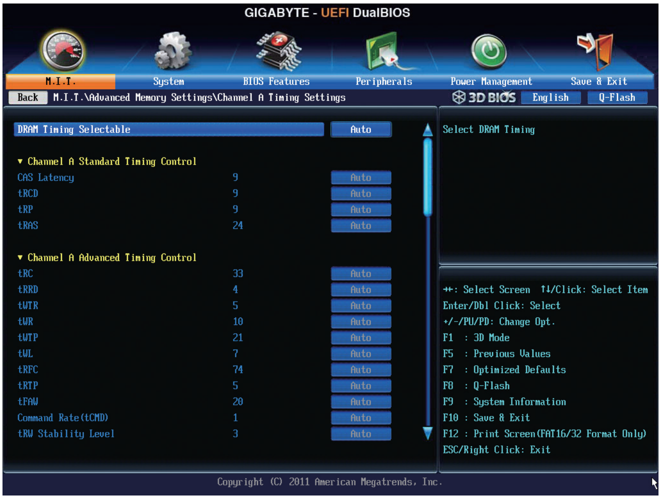
Enables or disables memory channel interleaving. **Enabled** allows the system to simultaneously access different channels of the memory to increase memory performance and stability. **Auto** lets the BIOS automatically configure this setting. (Default: Auto)

Rank Interleaving

Enables or disables memory rank interleaving. **Enabled** allows the system to simultaneously access different ranks of the memory to increase memory performance and stability. **Auto** lets the BIOS automatically configure this setting. (Default: Auto)

(Note) This item is present only when you install a CPU and a memory module that support this feature.

Channel A/B Timing Settings



GIGABYTE - UEFI DualBIOS
M.I.T.
System
BIOS Features
Peripherals
Power Management
Save & Exit
Back
3D BIOS
English
Q-Flash

```
M.I.T.\Advanced Memory Settings\Channel A Timing Settings

DRAM Timing Selectable                              Auto

▼ Channel A Standard Timing Control
CAS Latency                       9                 Auto
tRCD                              9                 Auto
tRP                               9                 Auto
tRAS                              24                Auto

▼ Channel A Advanced Timing Control
tRC                               33                Auto
tRRD                              4                 Auto
tWTR                              5                 Auto
tWR                               10                Auto
tWTP                              21                Auto
tWL                               7                 Auto
tRFC                              74                Auto
tRTP                              5                 Auto
tFAW                              20                Auto
Command Rate(tCMD)                1                 Auto
tRW Stability Level               3                 Auto

Select DRAM Timing

→←: Select Screen  ↑↓/Click: Select Item
Enter/Dbl Click: Select
+/-/PU/PD: Change Opt.
F1  : 3D Mode
F5  : Previous Values
F7  : Optimized Defaults
F8  : Q-Flash
F9  : System Information
F10 : Save & Exit
F12 : Print Screen(FAT16/32 Format Only)
ESC/Right Click: Exit

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```
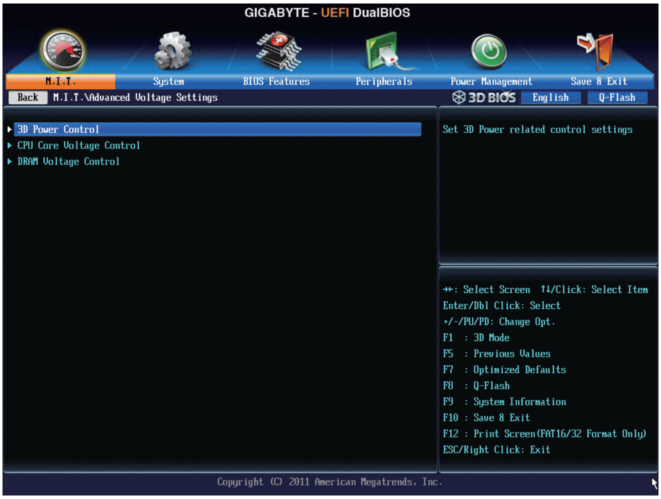

This sub-menu provides memory timing settings for each channel of memory. The respective timing setting screens are configurable only when **DRAM Timing Selectable** is set to **Quick** or **Expert**. Note: Your system may become unstable or fail to boot after you make changes on the memory timings. If this occurs, please reset the board to default values by loading optimized defaults or clearing the CMOS values.

Advanced Voltage Settings



GIGABYTE - UEFI DualBIOS
M.I.T.
System
BIOS Features
Peripherals
Power Management
Save & Exit
Back
3D BIOS
English
Q-Flash

```
M.I.T.\Advanced Voltage Settings

▸ 3D Power Control
▸ CPU Core Voltage Control
▸ DRAM Voltage Control

Set 3D Power related control settings

→←: Select Screen  ↑↓/Click: Select Item
Enter/Dbl Click: Select
+/-/PU/PD: Change Opt.
F1  : 3D Mode
F5  : Previous Values
F7  : Optimized Defaults
F8  : Q-Flash
F9  : System Information
F10 : Save & Exit
F12 : Print Screen(FAT16/32 Format Only)
ESC/Right Click: Exit

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```
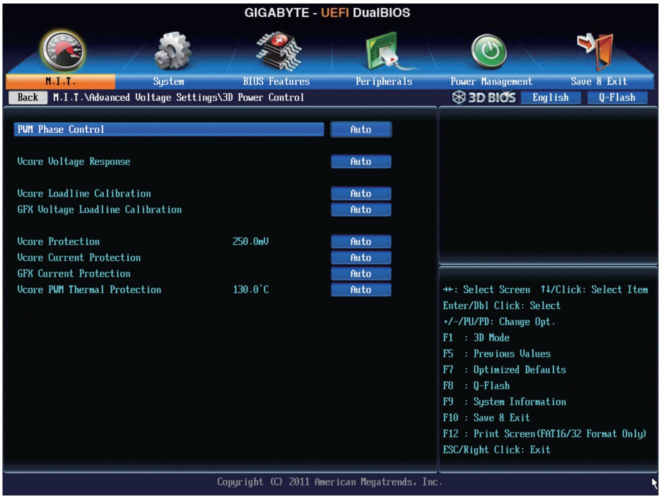

3D Power Control



```
M.I.T.\Advanced Voltage Settings\3D Power Control

PWM Phase Control                                Auto

Vcore Voltage Response                           Auto

Vcore Loadline Calibration                       Auto
GFX Voltage Loadline Calibration                 Auto

Vcore Protection                    250.0mV      Auto
Vcore Current Protection                         Auto
GFX Current Protection                           Auto
Vcore PWM Thermal Protection        130.0°C      Auto

→←: Select Screen  ↑↓/Click: Select Item
Enter/Dbl Click: Select
+/-/PU/PD: Change Opt.
F1  : 3D Mode
F5  : Previous Values
F7  : Optimized Defaults
F8  : Q-Flash
F9  : System Information
F10 : Save & Exit
F12 : Print Screen(FAT16/32 Format Only)
ESC/Right Click: Exit

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```

PWM Phase Control

Allows you to automatically change the PWM phase according to the CPU load. The power-saving levels are (from lowest to highest): eXm Perf (Extreme Performance), High Perf (High Performance), Perf (Performance), Balanced, Mid PWR (Mid Power), and Lite PWR (Light Power). **Auto** lets the BIOS automatically configure this setting. (Default: Auto)

Vcore Voltage Response

Allows you to configure the response time for Vcore changes using preset levels.

▸▸ Auto	Lets BIOS automatically configure this setting. (Default)
▸▸ Standard~Fast	Selects Standard or Fast which represents different levels of the response time for Vcore changes.

Vcore Loadline Calibration

Allows you to set the Load-Line Calibration level for the Vcore. The levels are (from highest to lowest): Extreme, Turbo, High, Medium, Low, and Standard. Selecting a higher level keeps the Vcore more consistent with what is set in BIOS under heavy load. **Auto** lets the BIOS automatically configure this setting and sets the voltage following Intel's specifications. (Default: Auto)

GFX Voltage Loadline Calibration

Allows you to set the Load-Line Calibration level for the GFX voltage. The levels are (from highest to lowest): High, Medium, Low, and Standard. Selecting a higher level keeps the GFX voltage more consistent with what is set in BIOS under heavy load. **Auto** lets the BIOS automatically configure this setting and sets the voltage following Intel's specifications. (Default: Auto)

Vcore Protection

Allows you to set the voltage limit on the Vcore for over-voltage protection. The adjustable range is from 150.0mV to 300.0mV. **Auto** lets the BIOS automatically configure this setting. (Default: Auto)

☞ Vcore Current Protection

Allows you to set the over-current protection level for the Vcore.

⏩ Auto	Lets BIOS automatically configure this setting. (Default)
⏩ Standard~Extreme	Selects Standard, Low, Medium, High, Turbo, or Extreme which represents different level of over-current protection for the Vcore.

☞ GFX Current Protection

Allows you to set the over-current protection level for the GFX voltage.

⏩ Auto	Lets BIOS automatically configure this setting. (Default)
⏩ Standard~Extreme	Selects Standard, Medium, High, Turbo, or Extreme which represents different level of over-current protection for the GFX voltage.

☞ Vcore PWM Thermal Protection

Allows you to set the PWM thermal protection threshold for the Vcore area. Options are 130.0^{o}C and 135.0^{o}C. **Auto** lets the BIOS automatically configure this setting. (Default: Auto)

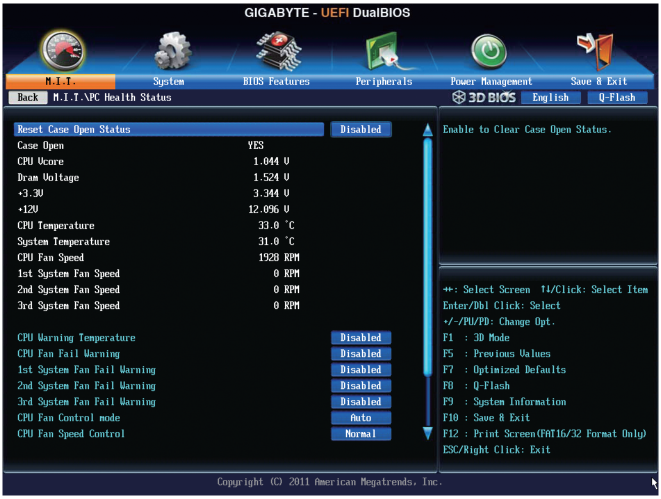
▸ CPU Core Voltage Control

This section provides CPU voltage control options.

▸ DRAM Voltage Control

This section provides memory voltage control options.

PC Health Status


GIGABYTE - UEFI DualBIOS
M.I.T.
System
BIOS Features
Peripherals
Power Management
Save & Exit
Back
M.I.T.\PC Health Status
3D BIOS
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Q-Flash

```
Reset Case Open Status                    Disabled
Case Open                         YES
CPU Vcore                          1.044 V
Dram Voltage                       1.524 V
+3.3V                              3.344 V
+12V                              12.096 V
CPU Temperature                     33.0 °C
System Temperature                  31.0 °C
CPU Fan Speed                       1928 RPM
1st System Fan Speed                   0 RPM
2nd System Fan Speed                   0 RPM
3rd System Fan Speed                   0 RPM

CPU Warning Temperature                   Disabled
CPU Fan Fail Warning                      Disabled
1st System Fan Fail Warning               Disabled
2nd System Fan Fail Warning               Disabled
3rd System Fan Fail Warning               Disabled
CPU Fan Control mode                      Auto
CPU Fan Speed Control                     Normal
```

Enable to Clear Case Open Status.

```
→←: Select Screen  ↑↓/Click: Select Item
Enter/Dbl Click: Select
+/-/PU/PD: Change Opt.
F1  : 3D Mode
F5  : Previous Values
F7  : Optimized Defaults
F8  : Q-Flash
F9  : System Information
F10 : Save & Exit
F12 : Print Screen(FAT16/32 Format Only)
ESC/Right Click: Exit
```

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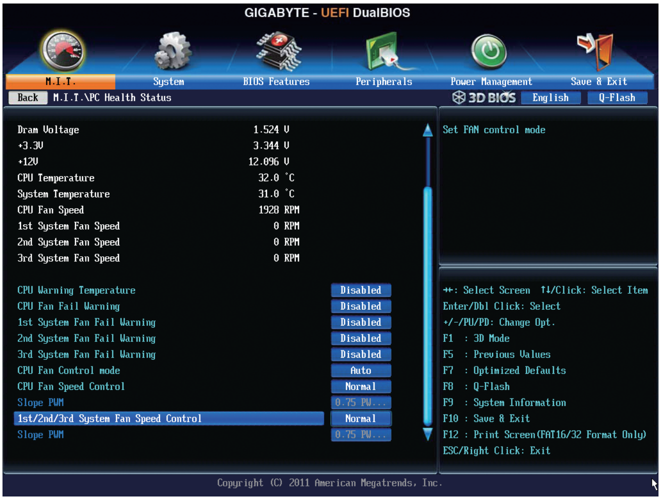
GIGABYTE - UEFI DualBIOS
M.I.T.
System
BIOS Features
Peripherals
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Save & Exit
Back
M.I.T.\PC Health Status
3D BIOS
English
Q-Flash

```
Dram Voltage                       1.524 V
+3.3V                              3.344 V
+12V                              12.096 V
CPU Temperature                     32.0 °C
System Temperature                  31.0 °C
CPU Fan Speed                       1928 RPM
1st System Fan Speed                   0 RPM
2nd System Fan Speed                   0 RPM
3rd System Fan Speed                   0 RPM

CPU Warning Temperature                   Disabled
CPU Fan Fail Warning                      Disabled
1st System Fan Fail Warning               Disabled
2nd System Fan Fail Warning               Disabled
3rd System Fan Fail Warning               Disabled
CPU Fan Control mode                      Auto
CPU Fan Speed Control                     Normal
Slope PWM                                 0.75 PW...
1st/2nd/3rd System Fan Speed Control      Normal
Slope PWM                                 0.75 PW...
```

Set FAN control mode

```
→←: Select Screen  ↑↓/Click: Select Item
Enter/Dbl Click: Select
+/-/PU/PD: Change Opt.
F1  : 3D Mode
F5  : Previous Values
F7  : Optimized Defaults
F8  : Q-Flash
F9  : System Information
F10 : Save & Exit
F12 : Print Screen(FAT16/32 Format Only)
ESC/Right Click: Exit
```

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☞ Reset Case Open Status

⏩ Disabled	Keeps or clears the record of previous chassis intrusion status. (Default)
⏩ Enabled	Clears the record of previous chassis intrusion status and the **Case Open** field will show "No" at next boot.

☞ Case Open

Displays the detection status of the chassis intrusion detection device attached to the motherboard CI header. If the system chassis cover is removed, this field will show "Yes", otherwise it will show "No". To clear the chassis intrusion status record, set **Reset Case Open Status** to **Enabled**, save the settings to the CMOS, and then restart your system.

CPU Vcore/Dram Voltage/+3.3V/+12V

Displays the current system voltages.

CPU/System Temperature

Displays current CPU/system temperature.

CPU/System Fan Speed

Displays current CPU/system fan speeds.

CPU Warning Temperature

Sets the warning threshold for CPU temperature. When CPU temperature exceeds the threshold, BIOS will emit warning sound. Options are: Disabled (default), 60°C/140°F, 70°C/158°F, 80°C/176°F, 90°C/194°F.

CPU/System Fan Fail Warning

Allows the system to emit warning sound if the fan is not connected or fails. Check the fan condition or fan connection when this occurs. (Default: Disabled)

CPU Fan Control mode

⏩ Auto	Lets the BIOS automatically detect the type of CPU fan installed and sets the optimal CPU fan control mode. (Default)
⏩ Voltage	Sets Voltage mode for a 3-pin CPU fan.
⏩ PWM	Sets PWM mode for a 4-pin CPU fan.

Note: The Voltage mode can be set for a 3-pin CPU fan or a 4-pin CPU fan. However, for a 4-pin CPU fan that is not designed following Intel PWM fan specifications, selecting PWM mode may not effectively reduce the fan speed.

CPU Fan Speed Control

Allows you to determine whether to enable the CPU fan speed control function and adjust the fan speed.

⏩ Normal	Allows the CPU fan to run at different speeds according to the CPU temperature. You can adjust the fan speed with EasyTune based on your system requirements. (Default)
⏩ Silent	Allows the CPU fan to run at slow speeds.
⏩ Manual	Allows you to control the CPU fan speed under the **Slope PWM** item.
⏩ Disabled	Allows the CPU fan to run at full speeds.

Slope PWM

Allows you to control the CPU fan speed. This item is configurable only when **CPU Fan Speed Control** is set to **Manual**. Options are: 0.75 PWM value /°C ~ 2.50 PWM value /°C.

1st/2nd/3rd System Fan Speed Control

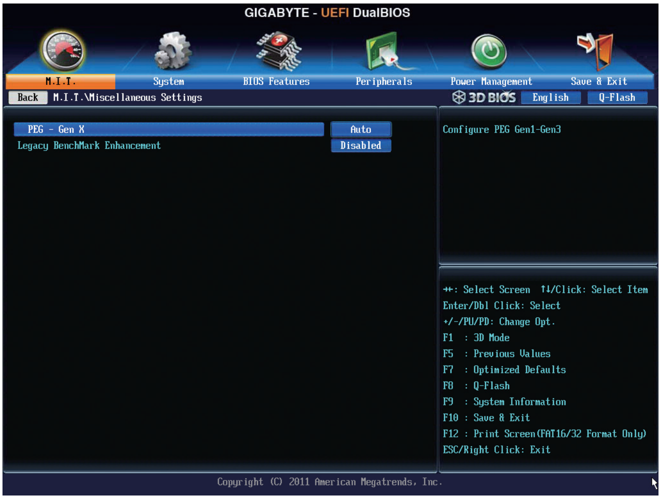
Allows you to determine whether to enable the system fan speed control function and adjust the fan speed.

⏩ Normal	Allows the system fan to run at different speeds according to the system temperature. You can adjust the fan speed with EasyTune based on your system requirements. (Default)
⏩ Silent	Allows the system fan to run at slow speeds.
⏩ Manual	Allows you to control the system fan speed under the **Slope PWM** item.
⏩ Disabled	Allows the system fan to run at full speeds.

Slope PWM

Allows you to control the system fan speed. This item is configurable only when **1st/2nd/3rd System Fan Speed Control** is set to **Manual**. Options are: 0.75 PWM value /°C ~ 2.50 PWM value /°C.

Miscellaneous Settings


GIGABYTE - UEFI DualBIOS
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BIOS Features
Peripherals
Power Management
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3D BIOS
English
Q-Flash

M.I.T.\Miscellaneous Settings

PEG - Gen X: Auto
Legacy BenchMark Enhancement: Disabled

Configure PEG Gen1-Gen3

```
→←: Select Screen  ↑↓/Click: Select Item
Enter/Dbl Click: Select
+/-/PU/PD: Change Opt.
F1  : 3D Mode
F5  : Previous Values
F7  : Optimized Defaults
F8  : Q-Flash
F9  : System Information
F10 : Save & Exit
F12 : Print Screen(FAT16/32 Format Only)
ESC/Right Click: Exit
```

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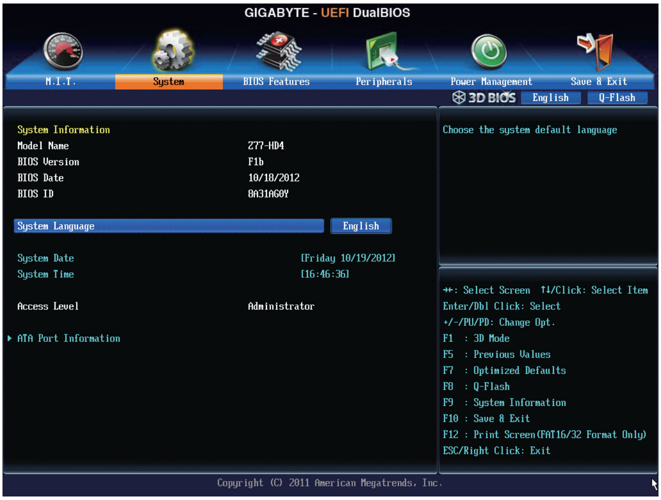
PEG - Gen X

Allows you to set the operation mode of the PCI Express slots to Gen 1, Gen 2, or Gen 3. Actual operation mode is subject to the hardware specification of each slot. For example, the PCI Express x1 slots can support up to Gen 2 mode only. **Auto** lets the BIOS automatically configure this setting. (Default: Auto)

Legacy BenchMark Enhancement

Allows you to determine whether to enhance some legacy benchmark performance. (Default: Disabled)

2-4 System



```
System Information
Model Name                              Z77-HD4
BIOS Version                            F1b
BIOS Date                               10/18/2012
BIOS ID                                 8A31AG0Y

System Language                         English

System Date                                       [Friday 10/19/2012]
System Time                                       [16:46:36]

Access Level                            Administrator

▶ ATA Port Information
```

```
Choose the system default language

→←: Select Screen  ↑↓/Click: Select Item
Enter/Dbl Click: Select
+/-/PU/PD: Change Opt.
F1  : 3D Mode
F5  : Previous Values
F7  : Optimized Defaults
F8  : Q-Flash
F9  : System Information
F10 : Save & Exit
F12 : Print Screen(FAT16/32 Format Only)
ESC/Right Click: Exit
```

This section provides information on your motherboard model and BIOS version. You can also select the default language used by the BIOS and manually set the system time.

☞ System Language

Selects the default language used by the BIOS.

☞ System Date

Sets the system date. The date format is week (read-only), month, date, and year. Use <Enter> to switch between the Month, Date, and Year fields and use the <Page Up> or <Page Down> key to set the desired value.

☞ System Time

Sets the system time. The time format is hour, minute, and second. For example, 1 p.m. is 13:0:0. Use <Enter> to switch between the Hour, Minute, and Second fields and use the <Page Up> or <Page Down> key to set the desired value.

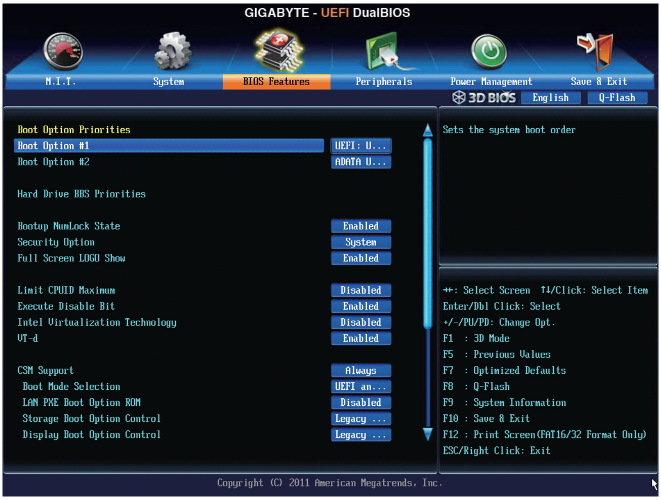
☞ Access Level

Displays the current access level depending on the type of password protection used. (If no password is set, the default will display as Administrator.) The Administrator level allows you to make changes to all BIOS settings; the User level only allows you to make changes to certain BIOS settings but not all.

▶ ATA Port Information

This section provides information on the device connected to each SATA port controlled by Intel Chipset.

2-5 BIOS Features



Boot Option Priorities
Boot Option #1 UEFI: U...
Boot Option #2 ADATA U...

Hard Drive BBS Priorities

Bootup NumLock State Enabled
Security Option System
Full Screen LOGO Show Enabled

Limit CPUID Maximum Disabled
Execute Disable Bit Enabled
Intel Virtualization Technology Disabled
VT-d Enabled

CSM Support Always
Boot Mode Selection UEFI an...
LAN PXE Boot Option ROM Disabled
Storage Boot Option Control Legacy ...
Display Boot Option Control Legacy ...

Sets the system boot order

→←: Select Screen ↑↓/Click: Select Item
Enter/Dbl Click: Select
+/-/PU/PD: Change Opt.
F1 : 3D Mode
F5 : Previous Values
F7 : Optimized Defaults
F8 : Q-Flash
F9 : System Information
F10 : Save & Exit
F12 : Print Screen(FAT16/32 Format Only)
ESC/Right Click: Exit

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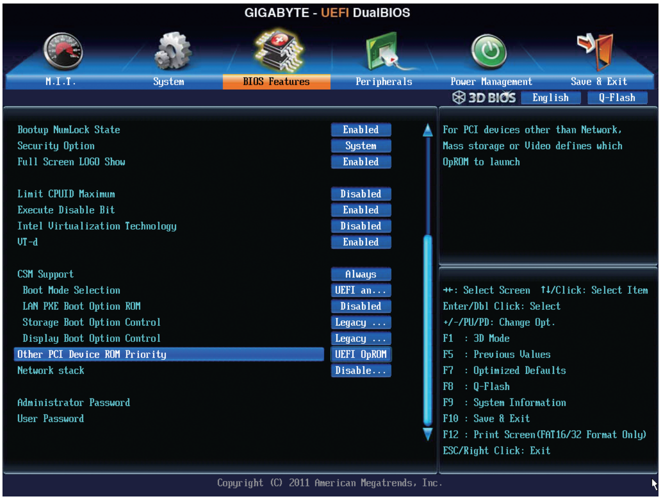

Bootup NumLock State Enabled
Security Option System
Full Screen LOGO Show Enabled

Limit CPUID Maximum Disabled
Execute Disable Bit Enabled
Intel Virtualization Technology Disabled
VT-d Enabled

CSM Support Always
Boot Mode Selection UEFI an...
LAN PXE Boot Option ROM Disabled
Storage Boot Option Control Legacy ...
Display Boot Option Control Legacy ...
Other PCI Device ROM Priority UEFI OpROM
Network stack Disable...

Administrator Password
User Password

For PCI devices other than Network, Mass storage or Video defines which OpROM to launch

→←: Select Screen ↑↓/Click: Select Item
Enter/Dbl Click: Select
+/-/PU/PD: Change Opt.
F1 : 3D Mode
F5 : Previous Values
F7 : Optimized Defaults
F8 : Q-Flash
F9 : System Information
F10 : Save & Exit
F12 : Print Screen(FAT16/32 Format Only)
ESC/Right Click: Exit

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☞ Boot Option Priorities

Specifies the overall boot order from the available devices. For example, you can set hard drive as the first priority (**Boot Option #1**) and DVD ROM drive as the second priority (**Boot Option #2**). The list only displays the device with the highest priority for a specific type. For example, only hard drive defined as the first priority on the **Hard Drive BBS Priorities** submenu will be presented here.

Removable storage devices that support GPT format will be prefixed with "UEFI:" string on the boot device list. To boot from an operating system that supports GPT partitioning, select the device prefixed with "UEFI:" string.

Or if you want to install an operating system that supports GPT partitioning such as Windows 7 64-bit, select the optical drive that contains the Windows 7 64-bit installation disk and is prefixed with "UEFI:" string.

Hard Drive/CD/DVD ROM Drive/Floppy Drive/Network Device BBS Priorities

Specifies the boot order for a specific device type, such as hard drives, optical drives, floppy disk drives, and devices that support Boot from LAN function, etc. Press <Enter> on this item to enter the submenu that presents the devices of the same type that are connected. This item is present only if at least one device for this type is installed.

Bootup NumLock State

Enables or disables Numlock feature on the numeric keypad of the keyboard after the POST. (Default: Enabled)

Security Option

Specifies whether a password is required every time the system boots, or only when you enter BIOS Setup. After configuring this item, set the password(s) under the **Administrator Password/User Password** item.

» Setup	A password is only required for entering the BIOS Setup program.
» System	A password is required for booting the system and for entering the BIOS Setup program. (Default)

Full Screen LOGO Show

Allows you to determine whether to display the GIGABYTE Logo at system startup. **Disabled** skips the GIGABYTE Logo when the system starts up. (Default: Enabled)

Limit CPUID Maximum (Note)

Allows you to determine whether to limit CPUID maximum value. Set this item to **Disabled** for Windows XP operating system; set this item to **Enabled** for legacy operating system such as Windows NT4.0. (Default: Disabled)

Execute Disable Bit (Note)

Enables or disables Intel Execute Disable Bit function. This function may enhance protection for the computer, reducing exposure to viruses and malicious buffer overflow attacks when working with its supporting software and system. (Default: Enabled)

Intel Virtualization Technology (Note)

Enables or disables Intel Virtualization Technology. Virtualization enhanced by Intel Virtualization Technology will allow a platform to run multiple operating systems and applications in independent partitions. With virtualization, one computer system can function as multiple virtual systems. (Default: Disabled)

VT-d (Note)

Enables or disables Intel Virtualization Technology for Directed I/O. (Default: Enabled)

CSM Support

Enables or disables UEFI CSM (Compatibility Support Module) to support a legacy PC boot process.

» Always	Enables UEFI CSM. (Default)
» Never	Disables UEFI CSM and supports UEFI BIOS boot process only.

(Note) This item is present only when you install a CPU that supports this feature. For more information about Intel CPUs' unique features, please visit Intel's website.

Boot Mode Selection

Allows you to select which type of operating system to boot.

UEFI and Legacy	Allows booting from operating systems that support legacy option ROM or UEFI option ROM. (Default)
Legacy Only	Allows booting from operating systems that only support legacy Option ROM.
UEFI Only	Allows booting from operating systems that only support UEFI Option ROM.

This item is configurable only when **CSM Support** is set to **Always**.

LAN PXE Boot Option ROM

Allows you to select whether to enable the legacy option ROM for the LAN controller. (Default: Disabled) This item is configurable only when **CSM Support** is set to **Always**.

Storage Boot Option Control

Allows you to select whether to enable the UEFI or legacy option ROM for the storage device controller.

Disabled	Disables option ROM.
Legacy Only	Enables legacy option ROM only. (Default)
UEFI Only	Enables UEFI option ROM only.
Legacy First	Enables legacy option ROM first.
UEFI First	Enables UEFI option ROM first.

This item is configurable only when **CSM Support** is set to **Always**.

Display Boot Option Control

Allows you to select whether to enable the UEFI or legacy option ROM for the graphics controller.

Disabled	Disables option ROM.
Legacy Only	Enables legacy option ROM only. (Default)
UEFI Only	Enables UEFI option ROM only.
Legacy First	Enables legacy option ROM first.
UEFI First	Enables UEFI option ROM first.

This item is configurable only when **CSM Support** is set to **Always**.

Other PCI Device ROM Priority

Allows you to select whether to enable the UEFI or Legacy option ROM for the PCI device controller other than the LAN, storage device, and graphics controllers.

Legacy OpROM	Enables legacy option ROM only.
UEFI OpROM	Enables UEFI option ROM only. (Default)

Network stack

Disables or enables booting from the network to install a GPT format OS, such as installing the OS from the Windows Deployment Services server. (Default: Disable Link)

Ipv4 PXE Support

Enables or disables IPv4 PXE Support. This item is configurable only when **Network stack** is enabled.

Ipv6 PXE Support

Enables or disables IPv6 PXE Support. This item is configurable only when **Network stack** is enabled.

☞ **Administrator Password**

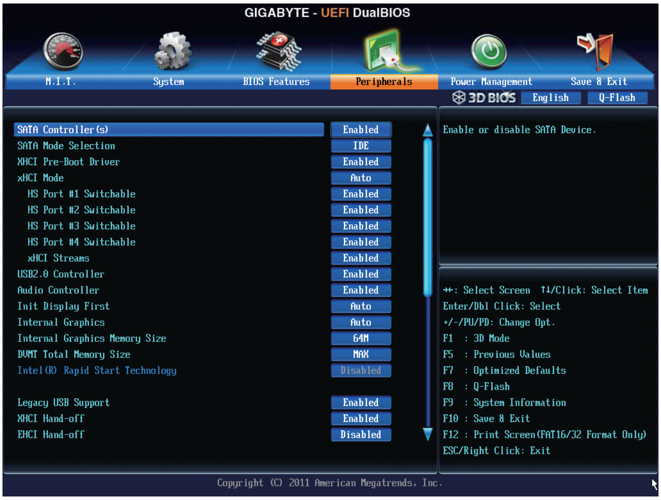
Allows you to configure an administrator password. Press <Enter> on this item, type the password, and then press <Enter>. You will be requested to confirm the password. Type the password again and press <Enter>. You must enter the administrator password (or user password) at system startup and when entering BIOS Setup. Differing from the user password, the administrator password allows you to make changes to all BIOS settings.

☞ **User Password**

Allows you to configure a user password. Press <Enter> on this item, type the password, and then press <Enter>. You will be requested to confirm the password. Type the password again and press <Enter>. You must enter the administrator password (or user password) at system startup and when entering BIOS Setup. However, the user password only allows you to make changes to certain BIOS settings but not all.

To cancel the password, press <Enter> on the password item and when requested for the password, enter the correct one first. When prompted for a new password, press <Enter> without entering any password. Press <Enter> again when prompted to confirm.

2-6 Peripherals



SATA Controller(s)	Enabled
SATA Mode Selection	IDE
XHCI Pre-Boot Driver	Enabled
xHCI Mode	Auto
HS Port #1 Switchable	Enabled
HS Port #2 Switchable	Enabled
HS Port #3 Switchable	Enabled
HS Port #4 Switchable	Enabled
xHCI Streams	Enabled
USB2.0 Controller	Enabled
Audio Controller	Enabled
Init Display First	Auto
Internal Graphics	Auto
Internal Graphics Memory Size	64M
DVMT Total Memory Size	MAX
Intel(R) Rapid Start Technology	Disabled
Legacy USB Support	Enabled
XHCI Hand-off	Enabled
EHCI Hand-off	Disabled

Enable or disable SATA Device.

→←: Select Screen ↑↓/Click: Select Item
Enter/Dbl Click: Select
+/-/PU/PD: Change Opt.
F1 : 3D Mode
F5 : Previous Values
F7 : Optimized Defaults
F8 : Q-Flash
F9 : System Information
F10 : Save & Exit
F12 : Print Screen(FAT16/32 Format Only)
ESC/Right Click: Exit

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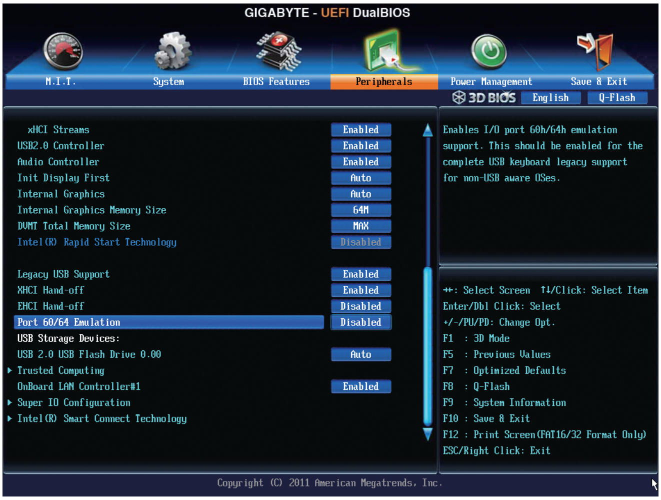

xHCI Streams	Enabled
USB2.0 Controller	Enabled
Audio Controller	Enabled
Init Display First	Auto
Internal Graphics	Auto
Internal Graphics Memory Size	64M
DVMT Total Memory Size	MAX
Intel(R) Rapid Start Technology	Disabled
Legacy USB Support	Enabled
XHCI Hand-off	Enabled
EHCI Hand-off	Disabled
Port 60/64 Emulation	Disabled
USB Storage Devices:	
USB 2.0 USB Flash Drive 0.00	Auto
▸ Trusted Computing	
OnBoard LAN Controller#1	Enabled
▸ Super IO Configuration	
▸ Intel(R) Smart Connect Technology	

Enables I/O port 60h/64h emulation support. This should be enabled for the complete USB keyboard legacy support for non-USB aware OSes.

→←: Select Screen ↑↓/Click: Select Item
Enter/Dbl Click: Select
+/-/PU/PD: Change Opt.
F1 : 3D Mode
F5 : Previous Values
F7 : Optimized Defaults
F8 : Q-Flash
F9 : System Information
F10 : Save & Exit
F12 : Print Screen(FAT16/32 Format Only)
ESC/Right Click: Exit

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☞ SATA Controller(s)

Enables or disables the integrated SATA controllers. (Default: Enabled)

☞ SATA Mode Selection

Enables or disables RAID for the SATA controllers integrated in the Intel Z77 Chipset or configures the SATA controllers to AHCI mode.

➤➤ IDE	Configures the SATA controller to IDE mode. (Default)
➤➤ RAID	Enables RAID for the SATA controller.
➤➤ AHCI	Configures the SATA controllers to AHCI mode. Advanced Host Controller Interface (AHCI) is an interface specification that allows the storage driver to enable advanced Serial ATA features such as Native Command Queuing and hot plug.

xHCI Pre-Boot Driver

Enabled	The USB 3.0 ports are routed to the xHCI controller before booting to OS. (Default)
Disabled	The USB 3.0 ports are routed to the EHCI controller before booting to OS.

If you want to set **xHCI Mode** below to Smart Auto, set this item to **Enabled**; when this item is set to **Disabled**, **xHCI Mode** will be automatically set to **Auto**.

xHCI Mode

Allows you to determine the operating mode for the xHCI controller in OS.

Smart Auto	This mode is available only when the BIOS supports the xHCI controller in the pre-boot environment. This mode is similar to **Auto**, but it adds the capability to route the ports to xHCI or EHCI according to setting used in previous boots (for non-G3 boot) in the pre-boot environment. This allows the use of USB 3.0 devices prior to OS boot. xHCI controller enabling and rerouting should follow the steps in **Auto**, when previous boot routs ports to EHCI. Note: This is the recommended mode when BIOS has xHCI pre-boot support.
Auto	BIOS routes the sharable ports to EHCI controller. Then it uses ACPI protocols to provide an option to enable the xHCI controller and reroute the sharable ports. Note: This is the recommended mode when BIOS does NOT have xHCI pre-boot support. (Default)
Enabled	All shared ports are eventually routed to the xHCI controller during the BIOS boot process. If BIOS does not have pre-boot support for the xHCI controller, it should initially route the sharable ports to the EHCI controller and then prior to OS boot it should route the ports to xHCI controller. Note: OS has to provide support for the xHCI controller in this mode. If the OS does not provide support, all sharable ports won't work.
Disabled	The USB 3.0 ports are routed to the EHCI controller and the xHCI controller is turned off. All USB 3.0 devices function as High Speed devices regardless of xHCI software support/availability. If this item is set to **Disabled**, the **HS Port #1/2/3/4 Switchable** and **xHCI Streams** items below will become unconfigurable.

HS Port #1 Switchable~HS Port #4 Switchable

Enabled	Corresponding USB 3.0 port is routed to xHCI. The USB 3.0 device attached on this port with Super-Speed capability is visible to xHCI controller. (Default)
Disabled	Corresponding USB 3.0 port is routed to EHCI. The USB 3.0 device attached on this port with Super-Speed capability will function as High-Speed.

xHCI Streams

Enables or disables multi-stream data transfer. Note: For Windows 7 USB 3.0 Streams support, devices may require UASP class driver updates from UASP driver vendors to be fully compatible with Intel USB 3.0 Streams Support. (Default: Enabled)

USB2.0 Controller

Enables or disables the integrated USB 2.0/1.1 controller. (Default: Enabled)

Audio Controller

Enables or disables the onboard audio function. (Default: Enabled)

If you wish to install a 3rd party add-in audio card instead of using the onboard audio, set this item to **Disabled**.

☞ Init Display First

Specifies the first initiation of the monitor display from the installed PCI graphics card, PCI Express graphics card or the onboard graphics.

➤➤ Auto	Lets BIOS automatically configure this setting. (Default)
➤➤ IGFX	Sets the onboard graphics as the first display.
➤➤ PEG	Sets the PCI Express graphics card on the PCIEX16 slot as the first display.
➤➤ PCI	Sets the graphics card on the PCI slot as the first display.

☞ Internal Graphics

Enables or disables the onboard graphics function. (Default: Auto)

☞ Internal Graphics Memory Size

Allows you to set the onboard graphics memory size. Options are: 32M~1024M. (Default: 64M)

☞ DVMT Total Memory Size

Allows you to allocate the DVMT memory size of the onboard graphics. Options are: 128M, 256M, MAX. (Default: MAX)

☞ Intel(R) Rapid Start Technology

Enables or disables Intel Rapid Start Technology. This item is configurable only when an SSD is installed. (Default: Disabled)

☞ Legacy USB Support

Allows USB keyboard/mouse to be used in MS-DOS. (Default: Enabled)

☞ XHCI Hand-off

Determines whether to enable XHCI Hand-off feature for an operating system without XHCI Hand-off support. (Default: Enabled)

☞ EHCI Hand-off

Determines whether to enable EHCI Hand-off feature for an operating system without EHCI Hand-off support. (Default: Disabled)

☞ Port 60/64 Emulation

Enables or disables emulation of I/O ports 64h and 60h. This should be enabled for full legacy support for USB keyboards/mice in MS-DOS or in operating system that does not natively support USB devices. (Default: Disabled)

☞ USB Storage Devices

Displays a list of connected USB mass storage devices. This item appears only when a USB storage device is installed.

► Trusted Computing

☞ TPM SUPPORT

Enables or disables Trusted Platform Module (TPM). Set this item to **Enable** when a TPM device is installed. (Default: Disable)

☞ OnBoard LAN Controller#1

Enables or disables the onboard LAN function. (Default: Enabled)

If you wish to install a 3rd party add-in network card instead of using the onboard LAN, set this item to **Disabled**.

- **Super IO Configuration**

  This section provides information on the super I/O chip and allows you to configure the serial port.

- **Serial Port A**

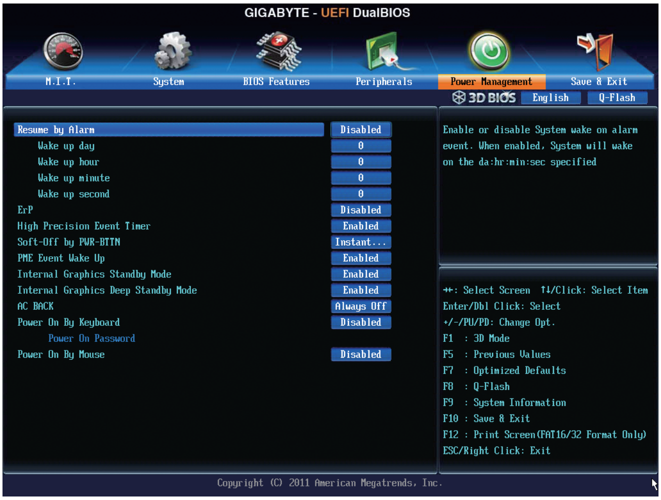
  Enables or disables the onboard serial port. (Default: Enabled)

- **Intel(R) Smart Connect Technology**

- **ISCT Configuration**

  Enables or disables Intel Smart Connect Technology. (Default: Disabled)

2-7 Power Management



```
Resume by Alarm                              Disabled
    Wake up day                              0
    Wake up hour                             0
    Wake up minute                           0
    Wake up second                           0
ErP                                          Disabled
High Precision Event Timer                   Enabled
Soft-Off by PWR-BTTN                         Instant...
PME Event Wake Up                            Enabled
Internal Graphics Standby Mode               Enabled
Internal Graphics Deep Standby Mode          Enabled
AC BACK                                      Always Off
Power On By Keyboard                         Disabled
      Power On Password
Power On By Mouse                            Disabled
```

```
Enable or disable System wake on alarm
event. When enabled, System will wake
on the da:hr:min:sec specified
```

```
→←: Select Screen  ↑↓/Click: Select Item
Enter/Dbl Click: Select
+/-/PU/PD: Change Opt.
F1  : 3D Mode
F5  : Previous Values
F7  : Optimized Defaults
F8  : Q-Flash
F9  : System Information
F10 : Save & Exit
F12 : Print Screen(FAT16/32 Format Only)
ESC/Right Click: Exit
```

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☞ Resume by Alarm

Determines whether to power on the system at a desired time. (Default: Disabled)

If enabled, set the date and time as following:

- Wake up day: Turn on the system at a specific time on each day or on a specific day in a month.
- Wake up hour/minute/second: Set the time at which the system will be powered on automatically.

Note: When using this function, avoid inadequate shutdown from the operating system or removal of the AC power, or the settings may not be effective.

☞ ErP

Determines whether to let the system consume least power in S5 (shutdown) state. (Default: Disabled)

Note: When this item is set to **Enabled**, the following functions will become unavailable: PME event wake up, power on by mouse, power on by keyboard, and wake on LAN.

☞ High Precision Event Timer (Note)

Enables or disables High Precision Event Timer (HPET) for Windows 7 operating system. (Default: Enabled)

☞ Soft-Off by PWR-BTTN

Configures the way to turn off the computer in MS-DOS mode using the power button.

Instant-Off	Press the power button and then the system will be turned off instantly. (Default)
Delay 4 Sec	Press and hold the power button for 4 seconds to turn off the system. If the power button is pressed for less than 4 seconds, the system will enter suspend mode.

☞ PME Event Wake Up

Allows the system to be awakened from an ACPI sleep state by a wake-up signal from a PCI or PCIe device. Note: To use this function, you need an ATX power supply providing at least 1A on the +5VSB lead. (Default: Enabled)

(Note) Supported on Windows 7 operating system only.

Internal Graphics Standby Mode

Allows you to determine whether to let the onboard graphics enter standby mode to decrease power consumption. (Default: Enabled)

Internal Graphics Deep Standby Mode

Allows you to determine whether to let the onboard graphics enter deeper standby mode. (Default: Enabled)

AC BACK

Determines the state of the system after the return of power from an AC power loss.

⏩ Memory	The system returns to its last known awake state upon the return of the AC power.
⏩ Always On	The system is turned on upon the return of the AC power.
⏩ Always Off	The system stays off upon the return of the AC power. (Default)

Power On By Keyboard

Allows the system to be turned on by a PS/2 keyboard wake-up event.

Note: To use this function, you need an ATX power supply providing at least 1A on the +5VSB lead.

⏩ Disabled	Disables this function. (Default)
⏩ Password	Set a password with 1~5 characters to turn on the system.
⏩ Keyboard 98	Press POWER button on the Windows 98 keyboard to turn on the system.
⏩ Any key	Press any key to turn on the system.

Power On Password

Set the password when **Power On By Keyboard** is set to **Password**.

Press <Enter> on this item and set a password with up to 5 characters and then press <Enter> to accept. To turn on the system, enter the password and press <Enter>.

Note: To cancel the password, press <Enter> on this item. When prompted for the password, press <Enter> again without entering the password to clear the password settings.

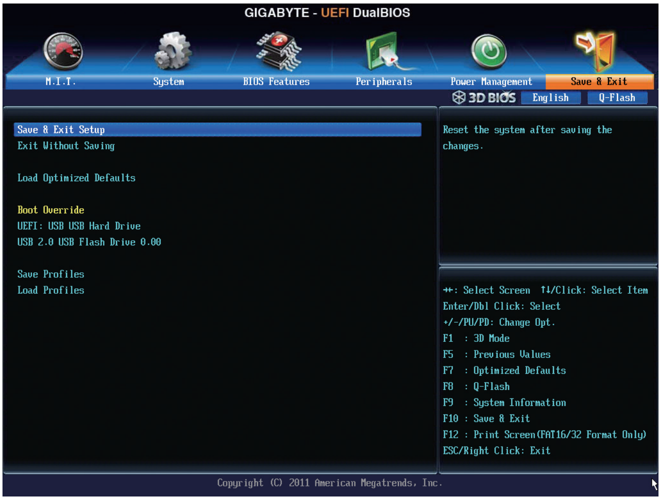
Power On By Mouse

Allows the system to be turned on by a PS/2 mouse wake-up event.

Note: To use this function, you need an ATX power supply providing at least 1A on the +5VSB lead.

⏩ Disabled	Disables this function. (Default)
⏩ Move	Move the mouse to turn on the system.
⏩ Double Click	Double click on left button on the mouse to turn on the system.

2-8 Save & Exit



```
Save & Exit Setup
Exit Without Saving

Load Optimized Defaults

Boot Override
UEFI: USB USB Hard Drive
USB 2.0 USB Flash Drive 0.00

Save Profiles
Load Profiles
```

```
Reset the system after saving the
changes.
```

```
→←: Select Screen  ↑↓/Click: Select Item
Enter/Dbl Click: Select
+/-/PU/PD: Change Opt.
F1  : 3D Mode
F5  : Previous Values
F7  : Optimized Defaults
F8  : Q-Flash
F9  : System Information
F10 : Save & Exit
F12 : Print Screen(FAT16/32 Format Only)
ESC/Right Click: Exit
```

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☞ Save & Exit Setup

Press <Enter> on this item and select **Yes**. This saves the changes to the CMOS and exits the BIOS Setup program. Select **No** or press <Esc> to return to the BIOS Setup Main Menu.

☞ Exit Without Saving

Press <Enter> on this item and select **Yes**. This exits the BIOS Setup without saving the changes made in BIOS Setup to the CMOS. Select **No** or press <Esc> to return to the BIOS Setup Main Menu.

☞ Load Optimized Defaults

Press <Enter> on this item and select **Yes** to load the optimal BIOS default settings. The BIOS defaults settings help the system to operate in optimum state. Always load the Optimized defaults after updating the BIOS or after clearing the CMOS values.

☞ Boot Override

Allows you to select a device to boot immediately. Press <Enter> on the device you select and select **Yes** to confirm. Your system will restart automatically and boot from that device.

☞ Save Profiles

This function allows you to save the current BIOS settings to a profile. You can create up to 8 profiles and save as Setup Profile 1~ Setup Profile 8. Press <Enter> to complete. Or you can select **Select File in HDD/USB/FDD** to save the profile to your storage device.

☞ Load Profiles

If your system becomes unstable and you have loaded the BIOS default settings, you can use this function to load the BIOS settings from a profile created before, without the hassles of reconfiguring the BIOS settings. First select the profile you wish to load and then press <Enter> to complete. You can select **Select File in HDD/USB/FDD** to input the profile previously created from your storage device or load the profile automatically created by the BIOS, such as reverting the BIOS settings to the last settings that worked properly (last known good record).

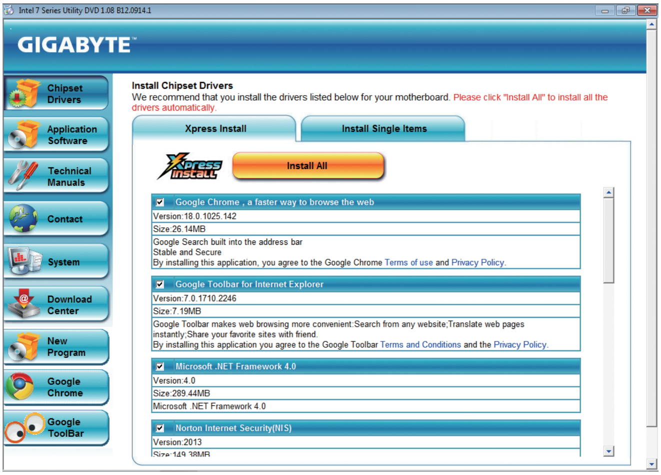
Chapter 3 Drivers Installation

- Before installing the drivers, first install the operating system.
- After installing the operating system, insert the motherboard driver disk into your optical drive. The driver Autorun screen is automatically displayed which looks like that shown in the screen shot below. (If the driver Autorun screen does not appear automatically, go to My Computer, double-click the optical drive and execute the **Run**.exe program.)

3-1 Installing Chipset Drivers

Now Loading Please wait...

After inserting the driver disk, "Xpress Install" will automatically scan your system and then list all the drivers that are recommended to install. You can click the **Install All** button and "Xpress Install" will install all the recommended drivers. Or click **Install Single Items** to manually select the drivers you wish to install.



Install Chipset Drivers

We recommend that you install the drivers listed below for your motherboard. Please click "Install All" to install all the drivers automatically.

☑ Google Chrome , a faster way to browse the web
Version:18.0.1025.142
Size:26.14MB
Google Search built into the address bar
Stable and Secure
By installing this application, you agree to the Google Chrome Terms of use and Privacy Policy.

☑ Google Toolbar for Internet Explorer
Version:7.0.1710.2246
Size:7.19MB
Google Toolbar makes web browsing more convenient:Search from any website;Translate web pages instantly;Share your favorite sites with friend.
By installing this application you agree to the Google Toolbar Terms and Conditions and the Privacy Policy.

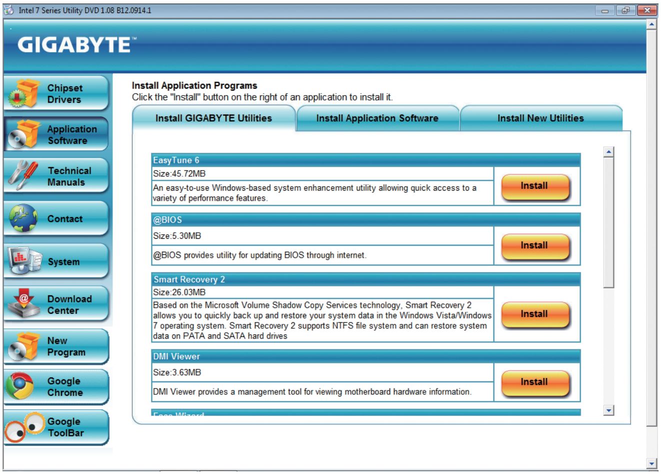
☑ Microsoft .NET Framework 4.0
Version:4.0
Size:289.44MB
Microsoft .NET Framework 4.0

☑ Norton Internet Security(NIS)
Version:2013
Size:149.38MB

- Please ignore the popup dialog box(es) (e.g. the **Found New Hardware Wizard**) displayed when "Xpress Install" is installing the drivers. Failure to do so may affect the driver installation.
- Some device drivers will restart your system automatically during the driver installation. After the system restart, "Xpress Install" will continue to install other drivers.
- After "Xpress Install" installs all of the drivers, a dialog box will appear asking whether to install new GIGABYTE utilities. Click **Yes** to automatically install the utilities. Or click **No** if you want to manually select the utilities to install on the **Application Software** page later.
- For USB 2.0 driver support under the Windows XP operating system, please install the Windows XP Service Pack 1 or later. After installing the SP1 (or later), if a question mark still exists in **Universal Serial Bus Controller** in **Device Manager**, please remove the question mark (by right-clicking your mouse and select **Uninstall**) and restart the system. (The system will then autodetect and install the USB 2.0 driver.)

3-2 Application Software

This page displays all the utilities and applications that GIGABYTE develops and some free software. You can click the **Install** button on the right of an item to install it.


Intel 7 Series Utility DVD 1.08 B12.0914.1
GIGABYTE
Chipset Drivers
Application Software
Technical Manuals
Contact
System
Download Center
New Program
Google Chrome
Google ToolBar
Install GIGABYTE Utilities
Install Application Software
Install New Utilities
Install

Install Application Programs
Click the "Install" button on the right of an application to install it.

EasyTune 6
Size:45.72MB
An easy-to-use Windows-based system enhancement utility allowing quick access to a variety of performance features.

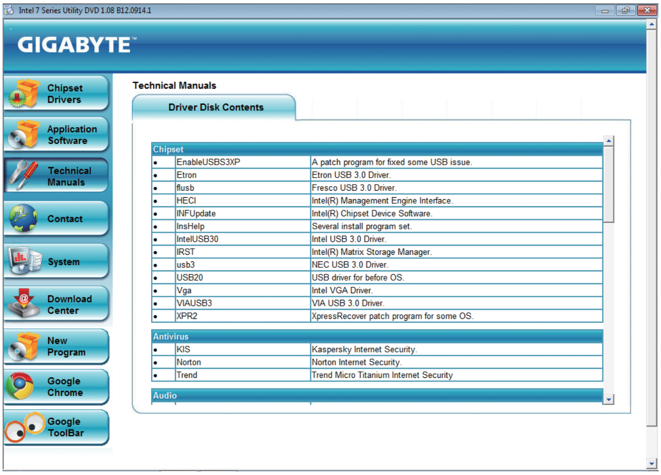
@BIOS
Size:5.30MB
@BIOS provides utility for updating BIOS through internet.

Smart Recovery 2
Size:26.03MB
Based on the Microsoft Volume Shadow Copy Services technology, Smart Recovery 2 allows you to quickly back up and restore your system data in the Windows Vista/Windows 7 operating system. Smart Recovery 2 supports NTFS file system and can restore system data on PATA and SATA hard drives

DMI Viewer
Size:3.63MB
DMI Viewer provides a management tool for viewing motherboard hardware information.

3-3 Technical Manuals

This page provides the content descriptions for this driver disk.


Intel 7 Series Utility DVD 1.08 B12.0914.1
GIGABYTE
Chipset Drivers
Application Software
Technical Manuals
Contact
System
Download Center
New Program
Google Chrome
Google ToolBar
Driver Disk Contents

Technical Manuals

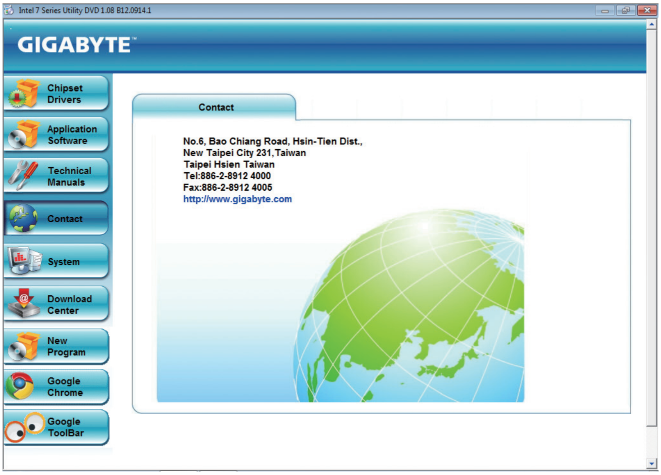
Chipset		
•	EnableUSBS3XP	A patch program for fixed some USB issue.
•	Etron	Etron USB 3.0 Driver.
•	flusb	Fresco USB 3.0 Driver.
•	HECI	Intel(R) Management Engine Interface.
•	INFUpdate	Intel(R) Chipset Device Software.
•	InsHelp	Several install program set.
•	IntelUSB30	Intel USB 3.0 Driver.
•	IRST	Intel(R) Matrix Storage Manager.
•	usb3	NEC USB 3.0 Driver.
•	USB20	USB driver for before OS.
•	Vga	Intel VGA Driver.
•	VIAUSB3	VIA USB 3.0 Driver.
•	XPR2	XpressRecover patch program for some OS.

Antivirus		
•	KIS	Kaspersky Internet Security.
•	Norton	Norton Internet Security.
•	Trend	Trend Micro Titanium Internet Security

Audio

3-4 Contact

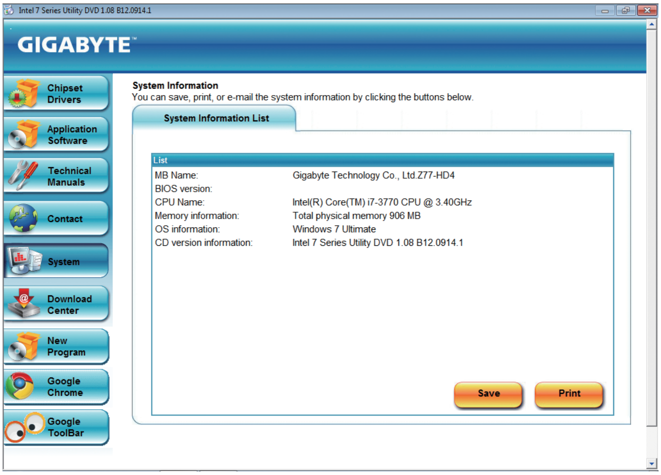
For the detailed contact information of the GIGABYTE Taiwan headquarter or worldwide branch offices, click the URL on this page to link to the GIGABYTE website.


Intel 7 Series Utility DVD 1.08 B12.0914.1
GIGABYTE
Chipset Drivers
Application Software
Technical Manuals
Contact
System
Download Center
New Program
Google Chrome
Google ToolBar
Contact

No.6, Bao Chiang Road, Hsin-Tien Dist.,
New Taipei City 231,Taiwan
Taipei Hsien Taiwan
Tel:886-2-8912 4000
Fax:886-2-8912 4005
http://www.gigabyte.com

3-5 System

This page provides the basic system information.

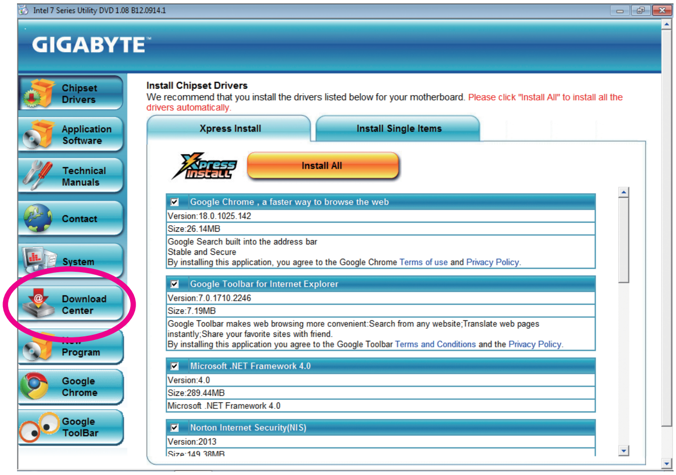

Intel 7 Series Utility DVD 1.08 B12.0914.1
GIGABYTE
Chipset Drivers
Application Software
Technical Manuals
Contact
System
Download Center
New Program
Google Chrome
Google ToolBar
System Information List
List
Save
Print

System Information
You can save, print, or e-mail the system information by clicking the buttons below.

MB Name: Gigabyte Technology Co., Ltd.Z77-HD4
BIOS version:
CPU Name: Intel(R) Core(TM) i7-3770 CPU @ 3.40GHz
Memory information: Total physical memory 906 MB
OS information: Windows 7 Ultimate
CD version information: Intel 7 Series Utility DVD 1.08 B12.0914.1

3-6 Download Center

To update the BIOS, drivers, or applications, click the **Download Center** button to link to the GIGABYTE website. The latest version of the BIOS, drivers, or applications will be displayed.


Intel 7 Series Utility DVD 1.08 B12.0914.1
GIGABYTE
Chipset Drivers
Application Software
Technical Manuals
Contact
System
Download Center
New Program
Google Chrome
Google ToolBar
Xpress Install
Install Single Items
Xpress Install
Install All

Install Chipset Drivers
We recommend that you install the drivers listed below for your motherboard. Please click "Install All" to install all the drivers automatically.

☑ Google Chrome , a faster way to browse the web
Version:18.0.1025.142
Size:26.14MB
Google Search built into the address bar
Stable and Secure
By installing this application, you agree to the Google Chrome Terms of use and Privacy Policy.

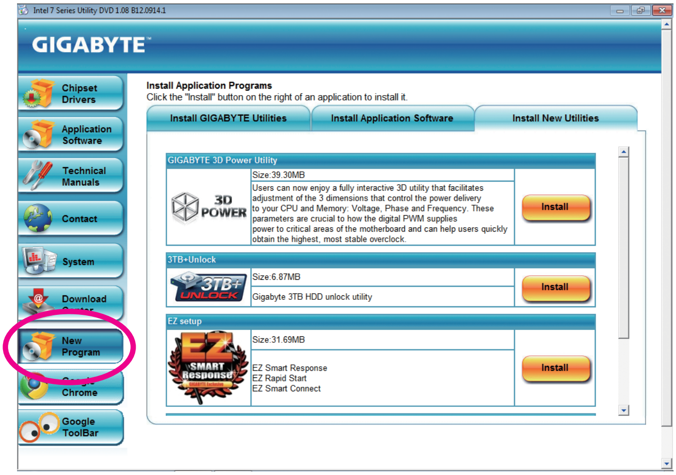
☑ Google Toolbar for Internet Explorer
Version:7.0.1710.2246
Size:7.19MB
Google Toolbar makes web browsing more convenient:Search from any website;Translate web pages instantly;Share your favorite sites with friend.
By installing this application you agree to the Google Toolbar Terms and Conditions and the Privacy Policy.

☑ Microsoft .NET Framework 4.0
Version:4.0
Size:289.44MB
Microsoft .NET Framework 4.0

☑ Norton Internet Security(NIS)
Version:2013
Size:149.38MB

3-7 New Program

This page provides a quick link to GIGABYTE's lately developed utilities for users to install. You can click the **Install** button on the right of an item to install it.


Intel 7 Series Utility DVD 1.08 B12.0914.1
GIGABYTE
Chipset Drivers
Application Software
Technical Manuals
Contact
System
Download Center
New Program
Google Chrome
Google ToolBar
Install GIGABYTE Utilities
Install Application Software
Install New Utilities
3D POWER
3TB+ UNLOCK
EZ SMART Response
Install
Install
Install

Install Application Programs
Click the "Install" button on the right of an application to install it.

GIGABYTE 3D Power Utility
Size:39.30MB
Users can now enjoy a fully interactive 3D utility that facilitates adjustment of the 3 dimensions that control the power delivery to your CPU and Memory: Voltage, Phase and Frequency. These parameters are crucial to how the digital PWM supplies power to critical areas of the motherboard and can help users quickly obtain the highest, most stable overclock.

3TB+Unlock
Size:6.87MB
Gigabyte 3TB HDD unlock utility

EZ setup
Size:31.69MB
EZ Smart Response
EZ Rapid Start
EZ Smart Connect

Chapter 4 Unique Features

4-1 BIOS Update Utilities

GIGABYTE motherboards provide two unique BIOS update tools, Q-Flash™ and @BIOS™. GIGABYTE Q-Flash and @BIOS are easy-to-use and allow you to update the BIOS without the need to enter MS-DOS mode. Additionally, this motherboard features the DualBIOS™ design, which enhances protection for the safety and stability of your computer by adding one more physical BIOS chip.

What is DualBIOS™?

Motherboards that support DualBIOS have two BIOS onboard, a main BIOS and a backup BIOS. Normally, the system works on the main BIOS. However, if the main BIOS is corrupted or damaged, the backup BIOS will take over on the next system boot and copy the BIOS file to the main BIOS to ensure normal system operation. For the sake of system safety, users cannot update the backup BIOS manually.

What is Q-Flash™?

With Q-Flash you can update the system BIOS without having to enter operating systems like MS-DOS or Window first. Embedded in the BIOS, the Q-Flash tool frees you from the hassles of going through complicated BIOS flashing process.

What is @BIOS™?

@BIOS allows you to update the system BIOS while in the Windows environment. @BIOS will download the latest BIOS file from the nearest @BIOS server site and update the BIOS.

4-1-1 Updating the BIOS with the Q-Flash Utility

A. Before You Begin

1. From GIGABYTE's website, download the latest compressed BIOS update file that matches your motherboard model.
2. Extract the file and save the new BIOS file (e.g. Z77HD4.F1) to your USB flash drive or hard drive. Note: The USB flash drive or hard drive must use FAT32/16/12 file system.
3. Restart the system. During the POST, press the <End> key to enter Q-Flash. Note: You can access Q-Flash by either pressing the <End> key during the POST or pressing the <F8> key in BIOS Setup. However, if the BIOS update file is saved to a hard drive in RAID/AHCI mode or a hard drive attached to an independent SATA controller, use the <End> key during the POST to access Q-Flash.

Because BIOS flashing is potentially risky, please do it with caution. Inadequate BIOS flashing may result in system malfunction.

B. Updating the BIOS

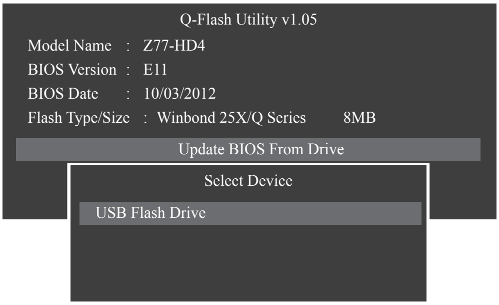
In the main menu of Q-Flash, use the keyboard or mouse to select an item to execute. When updating the BIOS, choose the location where the BIOS file is saved. The following procedure assumes that you save the BIOS file to a USB flash drive.

Step 1:

1. Insert the USB flash drive containing the BIOS file into the computer. In the main menu of Q-Flash, select **Update BIOS From Drive**.

    - The **Save BIOS to Drive** option allows you to save the current BIOS file.
    - Q-Flash only supports USB flash drive or hard drives using FAT32/16/12 file system.
    - If the BIOS update file is saved to a hard drive in RAID/AHCI mode or a hard drive attached to an independent SATA controller, use the <End> key during the POST to access Q-Flash.

2. Select **USB Flash Drive**.



Q-Flash Utility v1.05

Model Name : Z77-HD4

BIOS Version : E11

BIOS Date : 10/03/2012

Flash Type/Size : Winbond 25X/Q Series 8MB

Update BIOS From Drive

Select Device

USB Flash Drive

3. Select the BIOS update file.

    Make sure the BIOS update file matches your motherboard model.

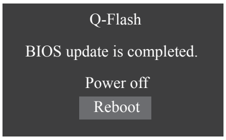
Step 2:

The process of the system reading the BIOS file from the USB flash drive is displayed on the screen. When the message "Are you sure to update BIOS?" appears, select **Yes** to begin the BIOS update. The monitor will display the update process.

- **Do not turn off or restart the system when the system is reading/updating the BIOS.**
- **Do not remove the USB flash drive or hard drive when the system is updating the BIOS.**

Step 3:

When the update process is complete, select **Reboot** to reboot the system.



Q-Flash

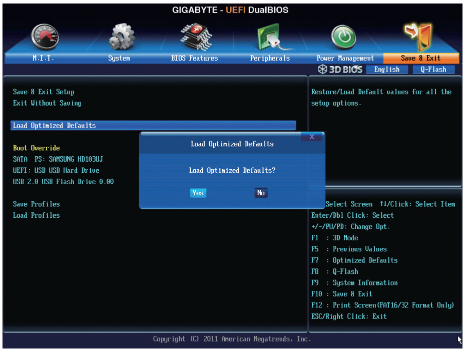
BIOS update is completed.

Power off

Reboot

Step 4:

During the POST, press <Delete> to enter BIOS Setup. Select **Load Optimized Defaults** on the **Save & Exit** screen and press <Enter> to load BIOS defaults. System will re-detect all peripheral devices after a BIOS update, so we recommend that you reload BIOS defaults.


GIGABYTE - UEFI DualBIOS
M.I.T.
System
BIOS Features
Peripherals
Power Management
Save & Exit
3D BIOS
English
Q-Flash
Save & Exit Setup
Exit Without Saving
Load Optimized Defaults
Boot Override
SATA PS: SAMSUNG HD103UJ
UEFI: USB USB Hard Drive
USB 2.0 USB Flash Drive 0.00
Save Profiles
Load Profiles
Load Optimized Defaults
X
Yes
No
Select Screen ↑↓/Click: Select Item
Enter/Dbl Click: Select
+/-/PU/PD: Change Opt.
F1 : 3D Mode
F5 : Previous Values
F7 : Optimized Defaults
F8 : Q-Flash
F9 : System Information
F10 : Save & Exit
F12 : Print Screen(FAT16/32 Format Only)
ESC/Right Click: Exit
Copyright (C) 2011 American Megatrends, Inc.

Restore/Load Default values for all the setup options.

Load Optimized Defaults?

Select **Yes** to load BIOS defaults

Step 5:

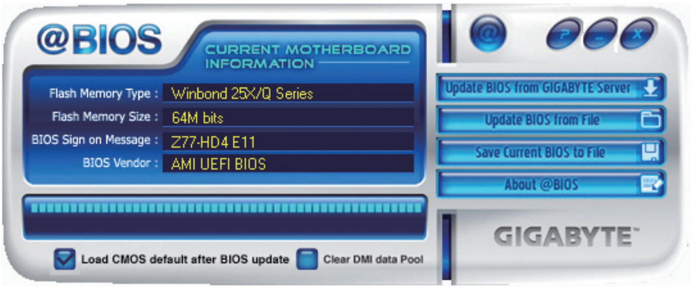
Select **Save & Exit Setup** and press <Enter>. And then select **Yes** to save settings to CMOS and exit BIOS Setup. The procedure is complete after the system restarts.

4-1-2 Updating the BIOS with the @BIOS Utility

A. Before You Begin

1. In Windows, close all applications and TSR (Terminate and Stay Resident) programs. This helps prevent unexpected failures when performing a BIOS update.
2. During the BIOS update process, ensure the Internet connection is stable and do NOT interrupt the Internet connection (for example, avoid a power loss or switching off the Internet). Failure to do so may result in a corrupted BIOS or a system that is unable to start.
3. Do not use the G.O.M. (GIGABYTE Online Management) function when using @BIOS.
4. GIGABYTE product warranty does not cover any BIOS damage or system failure resulting from an inadequate BIOS flashing.

B. Using @BIOS


@BIOS
CURRENT MOTHERBOARD INFORMATION
Update BIOS from GIGABYTE Server
Update BIOS from File
Save Current BIOS to File
About @BIOS
GIGABYTE

Flash Memory Type : Winbond 25X/Q Series
Flash Memory Size : 64M bits
BIOS Sign on Message : Z77-HD4 E11
BIOS Vendor : AMI UEFI BIOS
☑ Load CMOS default after BIOS update
☐ Clear DMI data Pool

1. Update BIOS from GIGABYTE Server **Update the BIOS Using the Internet Update Function:**
Click **Update BIOS from GIGABYTE Server**, select the @BIOS server site closest to your location and then download the BIOS file that matches your motherboard model. Follow the on-screen instructions to complete.

If the BIOS update file for your motherboard is not present on the @BIOS server site, please manually download the BIOS update file from GIGABYTE's website and follow the instructions in "Update the BIOS without Using the Internet Update Function" below.

2. Update BIOS from File **Update the BIOS without Using the Internet Update Function:**
Click **Update BIOS from File**, then select the location where you save the BIOS update file obtained from the Internet or through other source. Follow the on-screen instructions to complete.

3. Save Current BIOS to File **Save the Current BIOS File:**
Click **Save Current BIOS to File** to save the current BIOS file.

4. ☑ Load CMOS default after BIOS update **Load BIOS Defaults after BIOS Update:**
Select the **Load CMOS default after BIOS update** check box and then the system will automatically load BIOS defaults after BIOS update and after the system restarts.

C. After Updating the BIOS

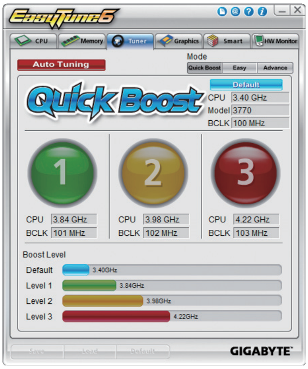
Restart your system after updating the BIOS.

Make sure that the BIOS file to be flashed matches your motherboard model. Updating the BIOS with an incorrect BIOS file could cause your system not to boot.

4-2 EasyTune 6

GIGABYTE's EasyTune 6 is a simple and easy-to-use interface that allows users to fine-tune their system settings or do overclock/overvoltage in Windows environment. The user-friendly EasyTune 6 interface also includes tabbed pages for CPU and memory information, letting users read their system-related information without the need to install additional software.

The EasyTune 6 Interface



CPU 3.40 GHz
Model 3770
BCLK 100 MHz

CPU 3.84 GHz
BCLK 101 MHz

CPU 3.98 GHz
BCLK 102 MHz

CPU 4.22 GHz
BCLK 103 MHz

Default 3.40GHz
Level 1 3.84GHz
Level 2 3.98GHz
Level 3 4.22GHz

Tabs Information

Tab	Function
CPU	The **CPU** tab provides information on the installed CPU and motherboard.
Memory	The **Memory** tab provides information on the installed memory module(s). You can select memory module on a specific slot to see its information.
Tuner	The **Tuner** tab allows you to change memory settings and voltages. • **Quick Boost mode** provides you with 3 levels of CPU frequency/base clock to choose to achieve desired system performance. After making changes in **Quick Boost mode** or clicking **Default** to restore to default values, be sure to restart your system for these changes to take effect. • **Easy mode** provides information on CPU/memory. • **Advanced mode** allows you to individually change system clock settings and voltages settings using the sliders. • **Save** allows you to save the current settings to a new profile (.txt file). • **Load** allows you to load previous settings from a profile. After making changes in **Easy mode/Advanced mode**, be sure to click **Set** for these changes to take effect or click **Default** to restore to default values. The Auto Tuning button automatically provides you with the fastest and most stable frequency to enhance system performance.
Graphics	The **Graphics** tab allows you to change the core clock and memory clock for your AMD or NVIDIA graphics card.
Smart	The **Smart** tab allows you to specify a Smart Fan mode. Smart Fan Advanced mode allows the fan speed to be changed linearly based on the temperature thresholds you set.
HW Monitor	The **HW Monitor** tab allows you to monitor hardware temperature, voltage and fan speed and set temperature/fan speed alarm. You can choose the alert sound from the buzzer or use your own sound file (.wav file).

Available functions in EasyTune 6 may differ by motherboard model. Grayed-out area(s) indicates that the item is not configurable or the function is not supported.

Incorrectly doing overclock/overvoltage may result in damage to the hardware components such as CPU, chipset, and memory and reduce the useful life of these components. Before you do the overclock/overvoltage, make sure that you fully know each function of EasyTune 6, or system instability or other unexpected results may occur.

4-3 Q-Share

Q-Share is an easy and convenient data sharing tool. After configuring your LAN connection settings and Q-Share, you are able to share your data with computers on the same network, making full use of Internet resources.

GIGABYTE™
Q-Share
Ver.1.2

Directions for using Q-Share

After installing Q-Share from the motherboard driver disk, go to Start>All Programs>GIGABYTE>Q-Share.exe to launch the Q-Share tool. Find the **Q-Share** icon in the notification area and right-click on this icon to configure the data sharing settings.

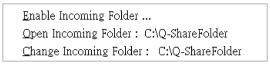

Enable Incoming Folder ...
Open Incoming Folder : C:\Q-ShareFolder
Change Incoming Folder : C:\Q-ShareFolder

Figure 1. Data Sharing Disabled

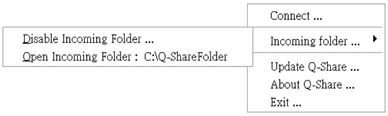

Disable Incoming Folder ...
Open Incoming Folder : C:\Q-ShareFolder
Connect ...
Incoming folder ...
Update Q-Share ...
About Q-Share ...
Exit ...

Figure 2. Data Sharing Enabled

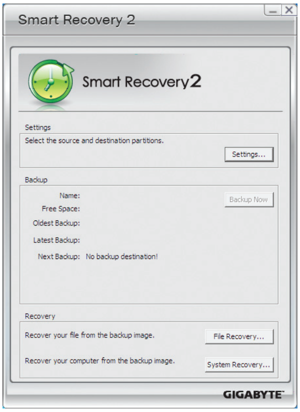
Options Descriptions

Option	Description
Connect ...	Displays the computers with data sharing enabled
Enable Incoming Folder ...	Enables data sharing
Disable Incoming Folder ...	Disables data sharing
Open Incoming Folder : C:\Q-ShareFolder	Accesses the shared data folder
Change Incoming Folder : C:\Q-ShareFolder	Changes the data folder to be shared (Note)
Update Q-Share ...	Updates Q-Share online
About Q-Share ...	Displays the current Q-Share version
Exit...	Exits Q-Share

(Note) This option is available only when data sharing is NOT enabled.

4-4 Smart Recovery 2

Smart Recovery 2 allows you to back up a partition as an image file every hour. You can use these images to restore your system or files when needed.


Smart Recovery 2
Smart Recovery2
Settings
Settings...
Backup
Backup Now
Recovery
File Recovery...
System Recovery...
GIGABYTE

Select the source and destination partitions.

Name:
Free Space:
Oldest Backup:
Latest Backup:
Next Backup: No backup destination!

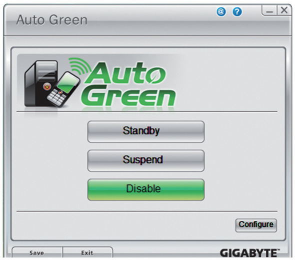
Recover your file from the backup image.

Recover your computer from the backup image.

The Smart Recovery 2 main menu:

Button	Function
Settings	Allows you to select the source and destination partition
Backup Now	Allows you to perform the backup immediately
File Recovery...	Allows you to recover your files from the backup image
System Recovery...	Allows you to recover your system from the backup image

- Supported operating systems: Windows 7 and Vista.
- Smart Recovery 2 only supports NTFS file system.
- You need to select the destination partition in Settings the first time you use Smart Recovery 2.
- The **Backup Now** button will be available only after you log in Windows for ten minutes.

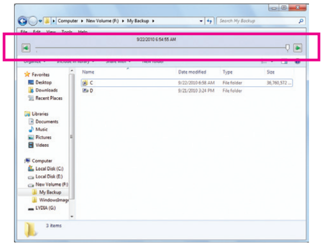

Auto Green
Auto Green
Standby
Suspend
Disable
Configure
Save
Exit
GIGABYTE

Creating a backup:

Click the **Settings** button on the main menu. In the **Settings** dialog box, select the source partition and destination partition and click **OK**. The initial backup will start after 10 minutes and regular backup will be performed hourly. Note: By default, all partitions on the system drive are selected as the backup source. The backup destination cannot be on the same partition as the backup source.

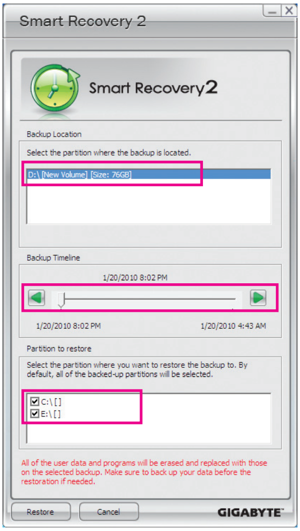
Saving the the backup to a network location:

If you want to save the backup to a network location, select **Browse network location**. Make sure your computer and the computer where you want to save the backup are in the same domain. Choose the network location where you want to store the backup and enter the user name and password. Follow the on-screen instructions to complete.


Computer ▸ New Volume (F:) ▸ My Backup ▸
9/22/2010 6:54:55 AM
Favorites
Desktop
Downloads
Recent Places
Libraries
Documents
Music
Pictures
Videos
Computer
Local Disk (C:)
Local Disk (E:)
New Volume (F:)
My Backup
Name
Date modified
Type
Size
C
D
File folder
2 items

Recovering a file:

Click the **File Recovery** button on the main menu. Use the time slider on the top of the popped out window to select a previous backup time. The right pane will display the backed-up partitions in the backup destination (in the **My Backup** folder). Browse to the file you want and copy it.



Select the partition where the backup is located.

Select the partition where you want to restore the backup to. By default, all of the backed-up partitions will be selected.

All of the user data and programs will be erased and replaced with those on the selected backup. Make sure to back up your data before the restoration if needed.

Recovering your system with Smart Recovery 2 (Windows 7 only):

Steps:

1. Click the **System Recovery** button on the main menu.
2. Select the location where your backup is saved.
3. Use the time slider to select a time point.
4. Select a partition backup created on the selected time point and click **Restore**.
5. Confirm whether to restart your system to proceed with the restore immediately or later. Once you respond "Yes" the system will restart to the Windows recovery environment. Follow the onscreen instructions to restore your system.

- For Windows Vista, refer to the steps below to use the original Windows installation disk for system recovery.
- All of your files and programs will be deleted and replaced with those on the selected backup. If needed, be sure to make a copy of your data before the restore.

Recovering your system using the original Windows installation disk:

In case Windows or your hard drive has serious errors, use the original Windows installation disk for system recovery.

Steps:

1. Restart your computer to boot from the original Windows installation disk.
2. When the Windows installation screen appears, select your language and click **Next**.
3. Select **Repair your computer**.
4. Select **Restore your computer using a system image that you created earlier** and then click **Next**.
5. Select the backup you want to use and then follow the on-screen instructions to complete.

For further instructions, refer to the Help file of Smart Recovery 2.

4-5 eXtreme Hard Drive (X.H.D)

With GIGABYTE eXtreme Hard Drive (X.H.D) (Note 1), users can quickly configure a RAID-ready system for RAID 0 when a new SATA drive is added. For a RAID 0 array that already exists, users also can use X.H.D to easily add a hard drive into the array to expand its capacity. All with a simple click of a button, X.H.D helps to enhance your hard drive read/write performance without the need for complex and time-consuming configurations. The following procedure details the steps to set up a RAID-ready system and configure it for RAID 0.

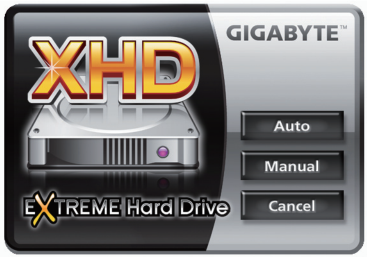
A. Setting Up a RAID-Ready System

Step 1: Configure the system BIOS
Enter the system BIOS Setup program to enable RAID for the Intel SATA controllers.

Step 2: Install the RAID driver and operating system
The X.H.D utility supports Windows 7/XP. Before installing the operating system, you have to load the SATA controller driver first. Without the driver, the hard drive may not be recognized during the Windows setup process. (For more details, refer to Chapter 5, "Installing the SATA RAID/AHCI Driver and Operating System.")

Step 3: Install the motherboard drivers and the X.H.D utiltiy
After installing the operating system, insert the motherboard driver disk. You can click the **Xpress Install All** button to automatically install all motherboard drivers, including the X.H.D utility. Or you can go to the **Application Software** screen to individually install the X.H.D utility later.

B. Using GIGABYTE eXtreme Hard Drive (X.H.D)



Instructions (Note 2)**:**
Before launching X.H.D, make sure the newly added harddrive has equal or greater capacity than the RAID-ready system drive. (To add a new hard drive into a RAID 0 array that's been created earlier, make sure the new drive is greater than or equal to the biggest drive in the array.)

1. Auto **To automatically set up a RAID 0 array:**
   Click **Auto** to automatically and quickly set up a RAID 0 array.

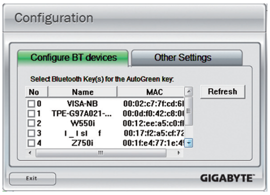
2. Manual **To manually set up a RAID array** (Note 3)**:**
   Click **Manual** to access the Intel Rapid Storage Technology, with which you can build a RAID 0, RAID 1, or other supported RAID array depending on your needs and hardware components.

3. Cancel **Exits the X.H.D utility:**
   Click **Cancel** to exit the X.H.D utility.

(Note 1) The X.H.D utility only supports the SATA controllers integrated in the Intel Chipset.
(Note 2) It is recommended that before you run the X.H.D utility, back up all of your data to avoid risk of hardware damage or lost of data.
(Note 3) If you manually build a non-RAID 0 array, you'll not be able to automatically set up a RAID 0 array later using the **Auto** function.

4-6 Auto Green

Auto Green is an easy-to-use tool that provides users with simple options to enable system power savings via a Bluetooth cell phone. When the phone is out of the range of the computer's Bluetooth receiver, the system will enter the specified power saving mode.



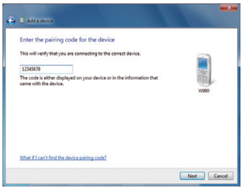
Select Bluetooth Key(s) for the AutoGreen key:

No	Name	MAC
☐ 0	VISA-NB	00:02:c7:7f:cd:6
☐ 1	TPE-G97A021-...	00:0d:f0:42:c8:0
☐ 2	W550i	00:12:ee:a5:c0:f
☐ 3	I _ I sI f	00:17:f2:a5:cf:72
☐ 4	Z750i	00:1f:e4:77:1e:4

The Configuration dialog box:

First, you have to set your Bluetooth cell phone as a portable key. On the Auto Green main menu, click **Configure** and then click **Configure BT devices**. Select the Bluetooth cell phone that you want to use as the portable key (Note 1). (If the screen doesn't display your Bluetooth cell phone, click **Refresh** to let Auto Green re-detect the device.)

Before creating a Bluetooth cell phone key, make sure your motherboard has a Bluetooth receiver and you have turned on the search and Bluetooth functions on your phone.



Enter the pairing code for the device

This will verify that you are connecting to the correct device.

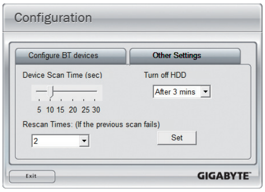
12345678

The code is either displayed on your device or in the information that came with the device.

What if I can't find the device pairing code?

Configuring the Bluetooth cell phone key:

After you select a cell phone, the **Add device** as shown on the left will appear. Enter a passkey (8~16 digits recommended) which will be used for pairing with the cell phone. Then enter the same passkey on your cell phone.



Device Scan Time (sec)

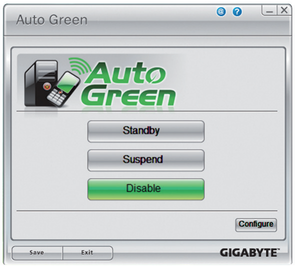
Turn off HDD: After 3 mins

Rescan Times: (If the previous scan fails) 2

Configuring other Bluetooth settings:

On the **Other Settings** tab, you can set how much time it takes to scan your Bluetooth cell phone key, how many times to rescan the key to make sure it is in range of your computer, and when to turn off the hard drive if the system energy saving state lasts over the predetermined period of time. After completing the settings, click **Set** for the settings to take effect and then click **Exit** to quit.

- Device Scan Time (sec.):
  Set the length of time Auto Green scans your Bluetooth cell phone key, ranging from 5 to 30 seconds in 5-second increment. Auto Green searches for the key based on the length of time you set.
- Rescan Times:
  Set how many times Auto Green will rescan your Bluetooth cell phone key if it does not detect it, ranging from 2 to 5 times. Auto Green will keep rescanning according to the times you set. When the times limit is reached and your Bluetooth cell phone key is still not detected, the system will enter the selected energy saving mode.
- Turn off HD:
  Set when to turn off the hard drive. If the system inactivity time exceeds the specified time limit, the hard drive will be turned off.



Selecting a system energy saving mode:

Depending on your needs, select a system power saving mode on the Auto Green main menu and click **Save** to save the settings.

Button	Description
Standby	Enters Power on Suspend mode
Suspend	Enters Suspend to RAM mode
Disable	Disables this function

The Bluetooth dongle included in the motherboard package (Note 2) allows you to wake up the system from Suspend to RAM mode without the need to press the power button first.

(Note 1) If your cell phone has been configured as the Auto Green key, you'll not be able to use it to connect to other Bluetooth device(s) when Auto Green is enabled.

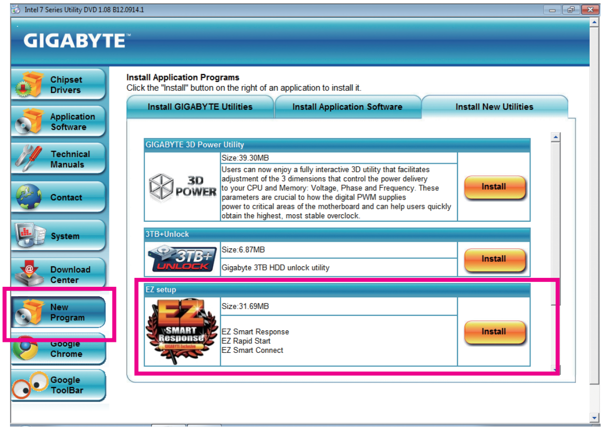
(Note 2) Whether the Bluetooth dongle is included depends on the motherboard models. Before installing the Bluetooth dongle, be sure to turn off other Bluetooth receiver on your computer.

4-7 EZ Setup

EZ Setup consists of the EZ Smart Response (Note), EZ Rapid Start, and EZ Smart Connect utilities. The EZ Setup application frees you from complicated installation and configuration process and allows you to use the application with ease.

Installing EZ Setup

After inserting the GIGABYTE motherboard driver disk, click **Express Install** to install all motherboard drivers. After completion, go to the **New Program** menu and click **Install** on the right of the EZ Setup application to install it.



Install Application Programs

Click the "Install" button on the right of an application to install it.

GIGABYTE 3D Power Utility	
Size:39.30MB	Install
Users can now enjoy a fully interactive 3D utility that facilitates adjustment of the 3 dimensions that control the power delivery to your CPU and Memory: Voltage, Phase and Frequency. These parameters are crucial to how the digital PWM supplies power to critical areas of the motherboard and can help users quickly obtain the highest, most stable overclock.	

3TB+Unlock	
Size:6.87MB	Install
Gigabyte 3TB HDD unlock utility	

EZ setup	
Size:31.69MB	Install
EZ Smart Response EZ Rapid Start EZ Smart Connect	

Intel 7 Series Utility DVD 1.08 B12.0914.1
GIGABYTE
Chipset Drivers
Application Software
Technical Manuals
Contact
System
Download Center
New Program
Google Chrome
Google ToolBar
Install GIGABYTE Utilities
Install Application Software
Install New Utilities
3D POWER
3TB+ UNLOCK
EZ SMART Response

Launching EZ Setup

Step 1:

While in the operating system, go to **Start\All Programs\GIGABYTE** and select **EZ Setup**. (Figure 1)

Step 2:

Select the utilities you wish to install and click **Setup** to begin the installation. (Figure 2)

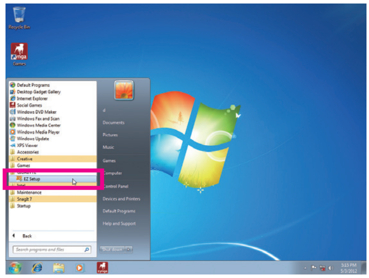
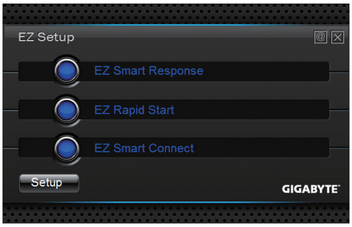


Figure 1



EZ Setup
EZ Smart Response
EZ Rapid Start
EZ Smart Connect
Setup
GIGABYTE

Figure 2

- For detailed configurations, please refer to Intel's documentation.
- During the installation process, the system will configure the BIOS settings and install required drivers. The system may restart automatically a few times.

(Note) Not supported on the Intel B75 Chipset.

4-7-1 Installing EZ Smart Response

A. System Requirements

1. An Intel Chipset-based motherboard supporting this feature (Note 1)
2. An Intel Core series processor
3. RAID enabled for the Intel SATA controllers in BIOS Setup
4. A conventional SATA disk and an SSD (Note 2)
5. Windows 7 with SP1 (Note 3)

If you have installed the operating system before configuring the Smart Response Technology, all original data on the hard disk will be lost once you enable RAID mode. It is recommended that you back up the hard disk before enabling the Smart Response Technology.

B. Installation

Step 1:

Select **EZ Smart Response** and click **Setup**. (Figure 1)

Step 2:

A warning message indicating that the system will be forced to RAID mode will appear. (Note 4) Select **Yes** and the system will restart. (Figure 2)

Step 3:

After the system restarts, it will install the Intel Raid Storage Technology driver automatically. The system will restart again after the driver installation.

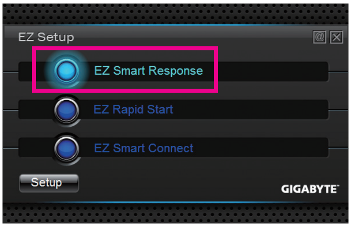
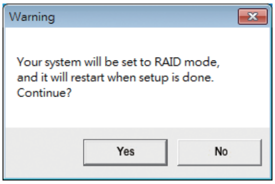


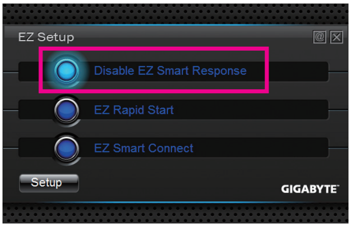
Figure 1



Your system will be set to RAID mode, and it will restart when setup is done. Continue?

Figure 2

C. Disabling EZ Smart Response



To disable EZ Smart Response, select **Disable EZ Smart Response** and click **Setup**.

(Note 1) Not supported on the Intel B75 Chipset.

(Note 2) The SSD works as a cache of the hard disk. The maximum cache memory size is 64 GB. If you use an SSD larger than 64 GB, the space beyond 64 GB can still be used for storing your data.

(Note 3) The operating system must be installed to the SATA disk.

(Note 4) Regardless of the BIOS settings, be it IDE or AHCI mode, the system will be forced to RAID mode.

4-7-2 Installing EZ Rapid Start

A. System Requirements

1. Intel Rapid Start Technology enabled in BIOS Setup
2. Windows 7 with SP1
3. An SSD with size larger than the total system memory
4. AHCI/RAID mode supported (please note if the SSD has been assigned as a member of a RAID array, it cannot be used to set up Intel Rapid Start store partition); IDE mode not supported

B. Installation

Step 1:

Select **EZ Rapid Start** and click **Setup**. (Figure 1)

Step 2:

A warning message indicating the system will be forced to RAID mode will appear. (Note) Select **Yes** and the system will restart and automatically enable Intel Rapid Start Technology in the BIOS Setup. (Figure 2)

Step 3:

After the system restarts, it will install the Intel Raid Start Technology Manager driver automatically. The system will restart again after the driver installation.

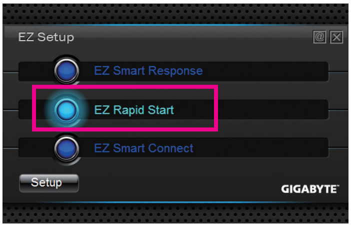
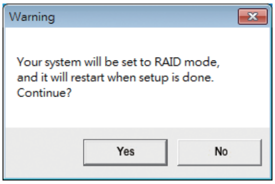


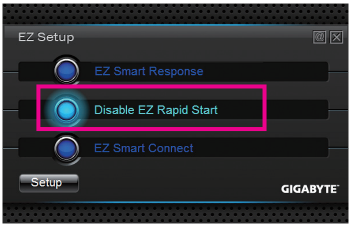
Figure 1



Your system will be set to RAID mode, and it will restart when setup is done. Continue?

Figure 2

C. Disabling EZ Rapid Start



To disable EZ Rapid Start, select **Disable EZ Rapid Start** and click **Setup**.

- The default compressed space is the system memory size plus 2 GB. For example, if the system memory size is 8 GB, the default compressed space is 8 GB plus 2 GB, so the SSD capacity will decrease by 10 GB. If EZ Rapid Start is disabled, the decreased 10 GB will be returned to the SSD.
- If you want to upgrade your system memory, disable EZ Rapid Start first and re-install it to ensure it can work normally.

(Note) On an Intel Z77/H77 Chipset motherboard, the Intel SATA controllers will be forced to RAID mode if they are set to IDE mode. On an Intel B75 Chipset motherboard, the Intel SATA controllers will be forced to AHCI mode if they are set to IDE mode.

4-7-3 Installing EZ Smart Connect

A. System Requirements

1. Intel Smart Connect Technology enabled in BIOS Setup
2. Windows 7 with SP1
3. Normal network connection
4. Programs added to the White List must be enabled

B. Installation

Step 1:

Select **EZ Smart Connect** and click **Setup**. Then restart your system. The system will restart and automatically enable Intel Smart Connect Technology in the BIOS Setup. (Figure 1)

Step 2:

Launch EZ Setup again, select **EZ Smart Connect**, and then click **Setup**. Follow the on-screen instructions to install the Intel Smart Connect Technology driver (Figure 2). Restart your system after the driver installation.

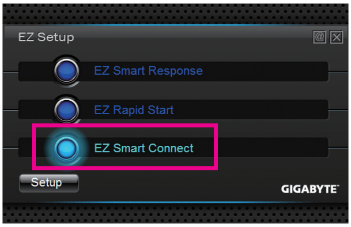
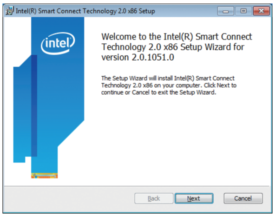

EZ Setup
EZ Smart Response
EZ Rapid Start
EZ Smart Connect
Setup
GIGABYTE

Figure 1


Intel(R) Smart Connect Technology 2.0 x86 Setup
intel
Back
Next
Cancel

Welcome to the Intel(R) Smart Connect Technology 2.0 x86 Setup Wizard for version 2.0.1051.0

The Setup Wizard will install Intel(R) Smart Connect Technology 2.0 x86 on your computer. Click Next to continue or Cancel to exit the Setup Wizard.

Figure 2

C. Configuring EZ Smart Connect

Select **Config** (Figure 3) and add new programs to the White Program list (Note) (Figure 4). Then click **OK** and restart the system.

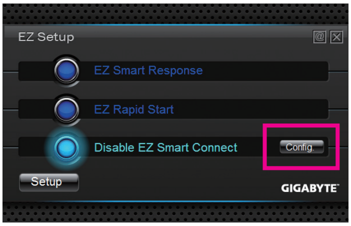
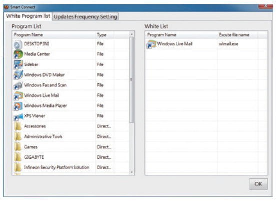

EZ Setup
EZ Smart Response
EZ Rapid Start
Disable EZ Smart Connect
Config
Setup
GIGABYTE

Figure 3


Smart Connect
White Program list
Updates Frequency Setting
OK

Program List

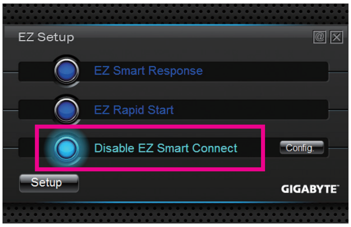
Program Name	Type
DESKTOP.INI	File
Media Center	File
Sidebar	File
Windows DVD Maker	File
Windows Fax and Scan	File
Windows Live Mail	File
Windows Media Player	File
XPS Viewer	File
Accessories	Direct...
Administrative Tools	Direct...
Games	Direct...
GIGABYTE	Direct...
Infineon Security Platform Solution	Direct...

White List

Program Name	Excute file name
Windows Live Mail	wlmail.exe

Figure 4

D. Disabling EZ Smart Connect


EZ Setup
EZ Smart Response
EZ Rapid Start
Disable EZ Smart Connect
Config
Setup
GIGABYTE

To disable EZ Smart Connect, select **Disable EZ Smart Connect** and click **Setup**.

(Note) This feature works best with programs designed to work automatically with the Internet to obtain their data such as Microsoft Outlook®, Microsoft Windows Live™ Mail, and Seesmic®.

Chapter 5 Appendix

5-1 Configuring SATA Hard Drive(s)

RAID Levels

	RAID 0	RAID 1	RAID 5	RAID 10
Minimum Number of Hard Drives	≥2	2	≥3	≥4
Array Capacity	Number of hard drives * Size of the smallest drive	Size of the smallest drive	(Number of hard drives -1) * Size of the smallest drive	(Number of hard drives/2) * Size of the smallest drive
Fault Tolerance	No	Yes	Yes	Yes

To configure SATA hard drive(s), follow the steps below:

A. Install SATA hard drive(s) in your computer.

B. Configure SATA controller mode in BIOS Setup.

C. Configure a RAID array in RAID BIOS. (Note 1)

D. Install the SATA RAID/AHCI driver and operating system. (Note 2)

Before you begin

Please prepare:

- At least two SATA hard drives (to ensure optimal performance, it is recommended that you use two hard drives with identical model and capacity). If you do not want to create RAID, you may prepare only one hard drive.
- Windows 7/XP setup disk.
- Motherboard driver disk.
- A USB floppy disk drive (needed during Windows XP installation)
- An empty formatted floppy disk (needed during Windows XP installation)

5-1-1 Configuring SATA Controllers

A. Installing SATA hard drive(s) in your computer

Attach one end of the SATA signal cable to the rear of the SATA hard drive and the other end to available SATA port (Note 3) on the motherboard. Then connect the power connector from your power supply to the hard drive.

(Note 1) Skip this step if you do not want to create RAID array on the SATA controller.

(Note 2) Required when the SATA controller is set to AHCI or RAID mode.

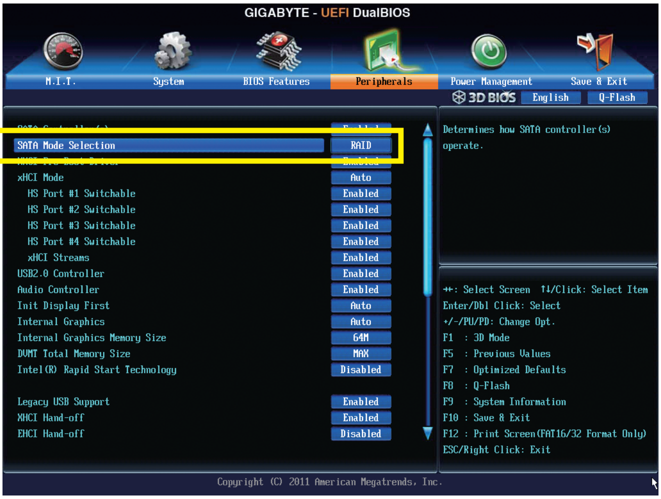
(Note 3) When a RAID set is built across the SATA 6Gb/s and SATA 3Gb/s channels, the system performance of the RAID set may vary depending on the devices being connected.

B. Configuring SATA controller mode in BIOS Setup

Make sure to configure the SATA controller mode correctly in system BIOS Setup.

Step 1:

Turn on your computer and press <Delete> to enter BIOS Setup during the POST (Power-On Self-Test). To create RAID, set **SATA Mode Selection** under the **Peripherals** menu to **RAID** (Figure 1). If you do not want to create RAID, set this item to **IDE** or **AHCI**.



```
SATA Mode Selection                        RAID
xHCI Mode                                  Auto
  HS Port #1 Switchable                    Enabled
  HS Port #2 Switchable                    Enabled
  HS Port #3 Switchable                    Enabled
  HS Port #4 Switchable                    Enabled
  xHCI Streams                             Enabled
USB2.0 Controller                          Enabled
Audio Controller                           Enabled
Init Display First                         Auto
Internal Graphics                          Auto
Internal Graphics Memory Size              64M
DVMT Total Memory Size                     MAX
Intel(R) Rapid Start Technology            Disabled

Legacy USB Support                         Enabled
XHCI Hand-off                              Enabled
EHCI Hand-off                              Disabled
```

```
Determines how SATA controller(s)
operate.
```

```
→←: Select Screen  ↑↓/Click: Select Item
Enter/Dbl Click: Select
+/-/PU/PD: Change Opt.
F1  : 3D Mode
F5  : Previous Values
F7  : Optimized Defaults
F8  : Q-Flash
F9  : System Information
F10 : Save & Exit
F12 : Print Screen(FAT16/32 Format Only)
ESC/Right Click: Exit
```

Copyright (C) 2011 American Megatrends, Inc.

Figure 1

Step 2:

Save changes and exit BIOS Setup.

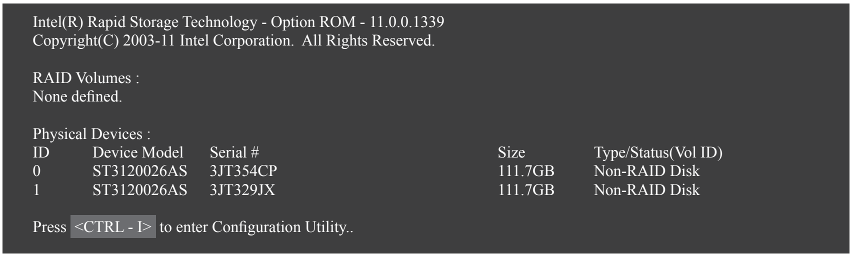
The BIOS Setup menus described in this section may differ from the exact settings for your motherboard. The actual BIOS Setup menu options you will see shall depend on the motherboard you have and the BIOS version.

C. Configuring a RAID array in RAID BIOS

Enter the RAID BIOS setup utility to configure a RAID array. Skip this step and proceed with the installation of Windows operating system for a non-RAID configuration.

Step 1:

After the POST memory test begins and before the operating system boot begins, look for a message which says "Press <Ctrl-I> to enter Configuration Utility" (Figure 2). Press <Ctrl> + <I> to enter the RAID Configuration Utility.



```
Intel(R) Rapid Storage Technology - Option ROM - 11.0.0.1339
Copyright(C) 2003-11 Intel Corporation.  All Rights Reserved.

RAID Volumes :
None defined.

Physical Devices :
ID      Device Model    Serial #                      Size        Type/Status(Vol ID)
0       ST3120026AS     3JT354CP                      111.7GB     Non-RAID Disk
1       ST3120026AS     3JT329JX                      111.7GB     Non-RAID Disk

Press <CTRL - I> to enter Configuration Utility..
```

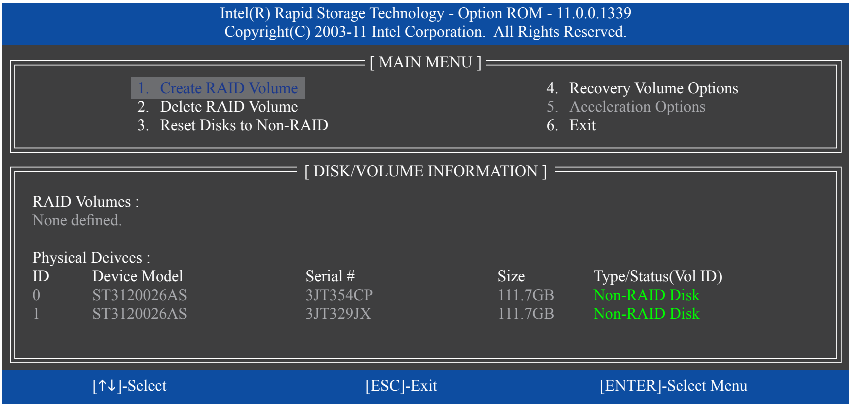
Figure 2

Step 2:

After you press <Ctrl> + <I>, the **MAIN MENU** screen will appear (Figure 3).

Create RAID Volume

If you want to create a RAID array, select **Create RAID Volume** in **MAIN MENU** and press <Enter>.

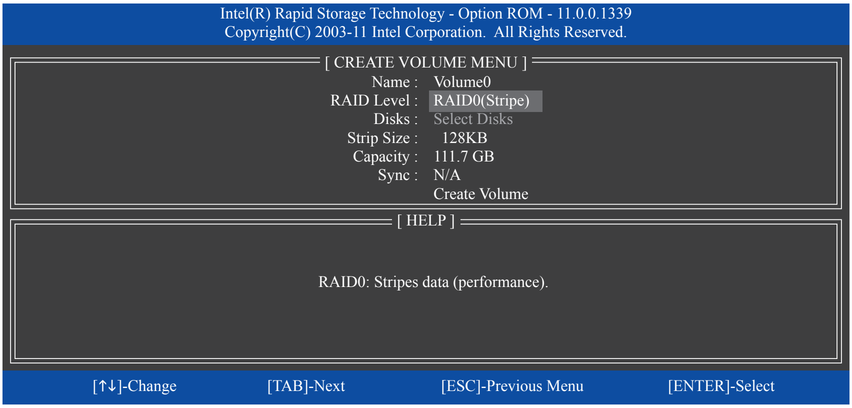


```
              Intel(R) Rapid Storage Technology - Option ROM - 11.0.0.1339
              Copyright(C) 2003-11 Intel Corporation.  All Rights Reserved.

                                  [ MAIN MENU ]
          1.  Create RAID Volume                        4.  Recovery Volume Options
          2.  Delete RAID Volume                        5.  Acceleration Options
          3.  Reset Disks to Non-RAID                   6.  Exit

                          [ DISK/VOLUME INFORMATION ]
RAID Volumes :
None defined.

Physical Deivces :
ID      Device Model              Serial #            Size        Type/Status(Vol ID)
0       ST3120026AS               3JT354CP            111.7GB     Non-RAID Disk
1       ST3120026AS               3JT329JX            111.7GB     Non-RAID Disk

        [↑↓]-Select               [ESC]-Exit              [ENTER]-Select Menu
```

Figure 3

Step 3:

After entering the **CREATE VOLUME MENU** screen, enter a volume name with 1~16 letters (letters cannot be special characters) under the **Name** item and press <Enter>. Then, select a RAID level (Figure 4). RAID levels supported include RAID 0, RAID 1, RAID 10, and RAID 5 (the selections available depend on the number of the hard drives being installed). Press <Enter> to proceed.

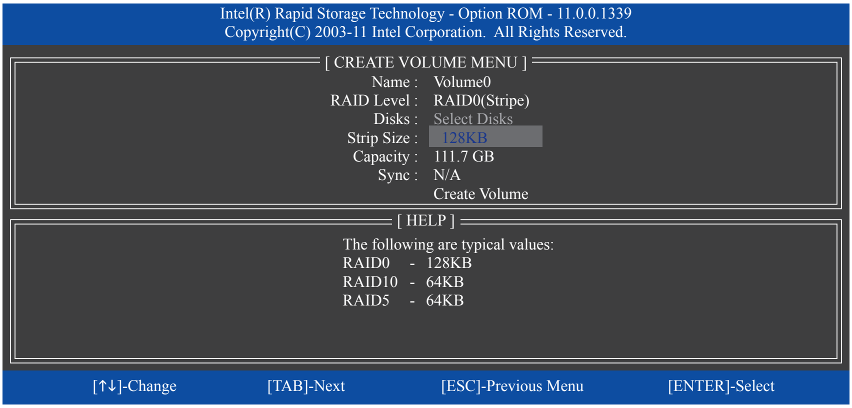


```
Intel(R) Rapid Storage Technology - Option ROM - 11.0.0.1339
Copyright(C) 2003-11 Intel Corporation.  All Rights Reserved.

[ CREATE VOLUME MENU ]
      Name :  Volume0
RAID Level :  RAID0(Stripe)
     Disks :  Select Disks
 Strip Size :   128KB
  Capacity :  111.7 GB
      Sync :  N/A
              Create Volume

[ HELP ]
RAID0: Stripes data (performance).
```

Figure 4

Step 4:

Under **Disks** item, select the hard drives to be included in the RAID array. If only two hard drives are installed, they will be automatically assigned to the array. Set the stripe block size (Figure 5) if necessary. The stripe block size can be set from 4 KB to 128 KB. Once you have selected the stripe block size, press <Enter>.

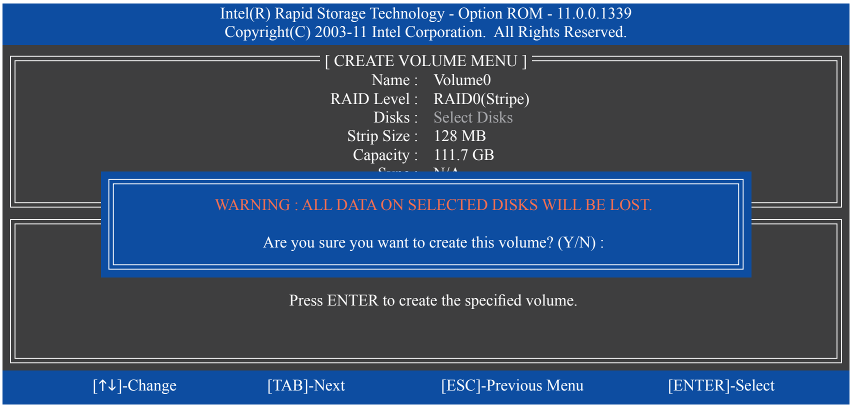


```
Intel(R) Rapid Storage Technology - Option ROM - 11.0.0.1339
Copyright(C) 2003-11 Intel Corporation.  All Rights Reserved.

[ CREATE VOLUME MENU ]
      Name :  Volume0
RAID Level :  RAID0(Stripe)
     Disks :  Select Disks
 Strip Size :   128KB
  Capacity :  111.7 GB
      Sync :  N/A
              Create Volume

[ HELP ]
The following are typical values:
RAID0    -  128KB
RAID10   -  64KB
RAID5    -  64KB
```

Figure 5

Step 5:

Enter the array capacity and press <Enter>. Finally press <Enter> on the **Create Volume** item to begin creating the RAID array. When prompted to confirm whether to create this volume, press <Y> to confirm or <N> to cancel (Figure 6).

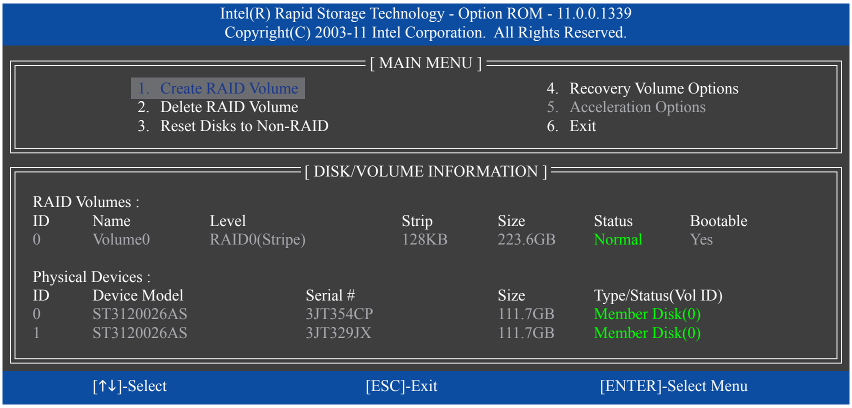


```
Intel(R) Rapid Storage Technology - Option ROM - 11.0.0.1339
Copyright(C) 2003-11 Intel Corporation.  All Rights Reserved.

[ CREATE VOLUME MENU ]
      Name :   Volume0
RAID Level :   RAID0(Stripe)
     Disks :   Select Disks
Strip Size :   128 MB
  Capacity :   111.7 GB

WARNING : ALL DATA ON SELECTED DISKS WILL BE LOST.

Are you sure you want to create this volume? (Y/N) :

Press ENTER to create the specified volume.
```

[↑↓]-Change
[TAB]-Next
[ESC]-Previous Menu
[ENTER]-Select

Figure 6

When completed, you can see detailed information about the RAID array in the **DISK/VOLUME INFORMATION** section, including the RAID level, stripe block size, array name, and array capacity, etc. (Figure 7)



```
Intel(R) Rapid Storage Technology - Option ROM - 11.0.0.1339
Copyright(C) 2003-11 Intel Corporation.  All Rights Reserved.

[ DISK/VOLUME INFORMATION ]
RAID Volumes :
ID    Name       Level             Strip    Size      Status    Bootable
0     Volume0    RAID0(Stripe)     128KB    223.6GB   Normal    Yes

Physical Devices :
ID    Device Model      Serial #      Size      Type/Status(Vol ID)
0     ST3120026AS       3JT354CP      111.7GB   Member Disk(0)
1     ST3120026AS       3JT329JX      111.7GB   Member Disk(0)
```

[MAIN MENU]
1. Create RAID Volume
2. Delete RAID Volume
3. Reset Disks to Non-RAID
4. Recovery Volume Options
5. Acceleration Options
6. Exit
[↑↓]-Select
[ESC]-Exit
[ENTER]-Select Menu

Figure 7

To exit the RAID BIOS utility, press <Esc> or select **6. Exit** in **MAIN MENU**.

Now, you can proceed to install the SATA RAID/AHCI driver and operating system.

Recovery Volume Options

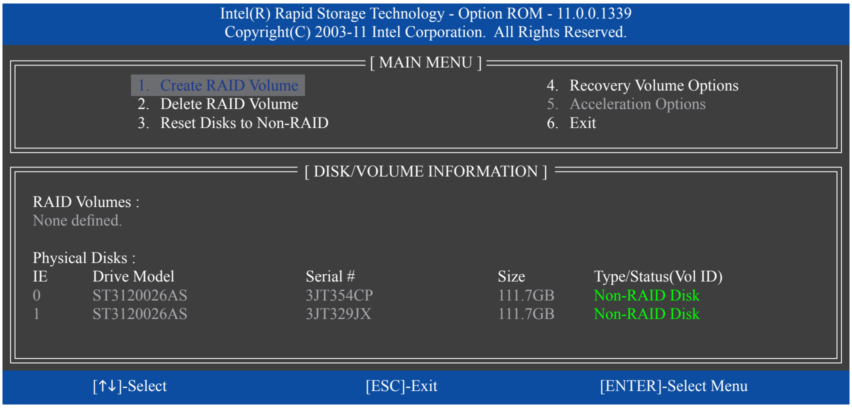
Intel Rapid Recover Technology provides data protection by allowing users to easily restore data and system operation using a designated recovery drive. With the Rapid Recovery Technology, which employs RAID 1 functionality, users can copy the data from the master drive to the recovery drive; if needed, the data on the recovery drive can be restored back to the master drive.

Before you begin:

- The recovery drive must have equal or greater capacity than the master drive.
- A recovery volume can be created with two hard drives only. A recovery volume and a RAID array cannot co-exist in the system at the same time, that is, if you have already created a recovery volume, you are unable to create a RAID array.
- By default, only the master drive can be viewed in the operating system; the recovery drive is hidden.

Step 1:

Select **Create RAID Volume** in **MAIN MENU** and press <Enter> (Figure 8).

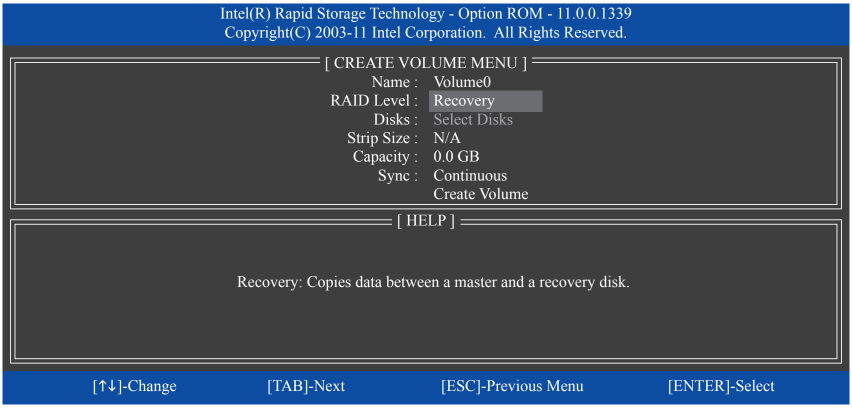


```
                Intel(R) Rapid Storage Technology - Option ROM - 11.0.0.1339
                 Copyright(C) 2003-11 Intel Corporation.  All Rights Reserved.

                                   [ MAIN MENU ]
              1.  Create RAID Volume                      4.  Recovery Volume Options
              2.  Delete RAID Volume                      5.  Acceleration Options
              3.  Reset Disks to Non-RAID                 6.  Exit

                           [ DISK/VOLUME INFORMATION ]
   RAID Volumes :
   None defined.

   Physical Disks :
   IE     Drive Model           Serial #            Size       Type/Status(Vol ID)
   0      ST3120026AS           3JT354CP            111.7GB    Non-RAID Disk
   1      ST3120026AS           3JT329JX            111.7GB    Non-RAID Disk

          [↑↓]-Select               [ESC]-Exit              [ENTER]-Select Menu
```

Figure 8

Step 2:

After entering the volume name, select **Recovery** under the **RAID Level** item and press <Enter> (Figure 9).

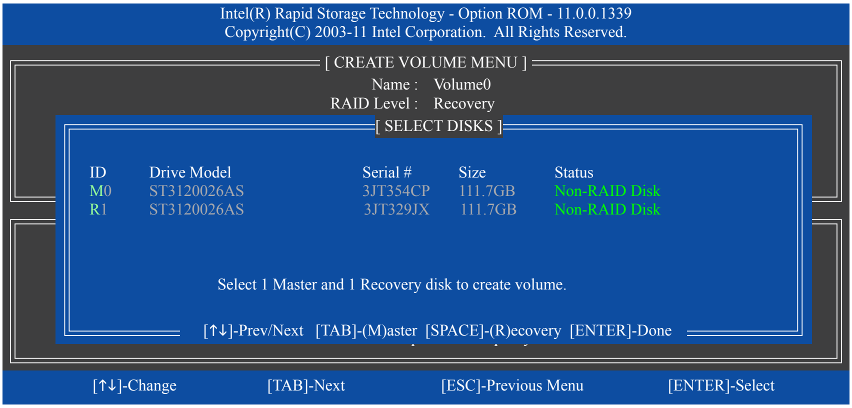


```
                Intel(R) Rapid Storage Technology - Option ROM - 11.0.0.1339
                 Copyright(C) 2003-11 Intel Corporation.  All Rights Reserved.

                               [ CREATE VOLUME MENU ]
                                  Name :   Volume0
                            RAID Level :   Recovery
                                 Disks :   Select Disks
                             Strip Size :   N/A
                              Capacity :   0.0 GB
                                  Sync :   Continuous
                                           Create Volume
                                     [ HELP ]

                  Recovery: Copies data between a master and a recovery disk.

          [↑↓]-Change         [TAB]-Next        [ESC]-Previous Menu        [ENTER]-Select
```

Figure 9

Step 3:

Press <Enter> under the **Select Disks** item. In the **SELECT DISKS** box, press <Tab> on the hard drive you want to use for the master drive and press <Space> on the hard drive you want to use for the recovery drive. (Make sure the recovery drive has equal or larger capacity than the master drive.) Then press <Enter> to confirm (Figure 10).



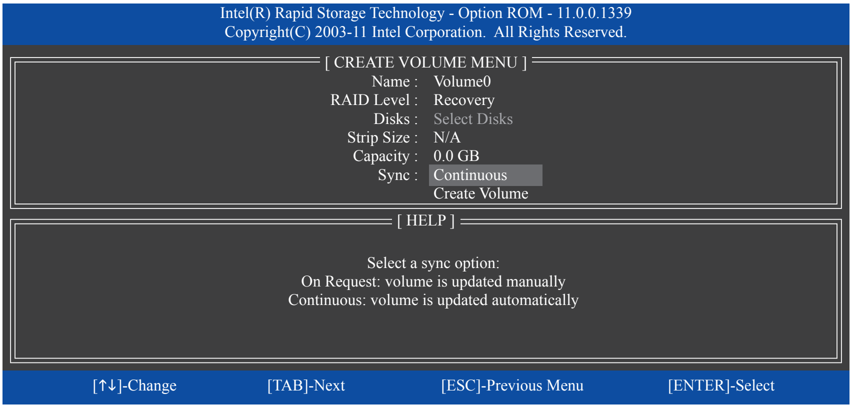
```
Intel(R) Rapid Storage Technology - Option ROM - 11.0.0.1339
Copyright(C) 2003-11 Intel Corporation.  All Rights Reserved.

[ CREATE VOLUME MENU ]
      Name :   Volume0
RAID Level :   Recovery

[ SELECT DISKS ]
ID   Drive Model        Serial #    Size      Status
M0   ST3120026AS        3JT354CP    111.7GB   Non-RAID Disk
R1   ST3120026AS        3JT329JX    111.7GB   Non-RAID Disk

Select 1 Master and 1 Recovery disk to create volume.
```

[↑↓]-Prev/Next   [TAB]-(M)aster [SPACE]-(R)ecovery [ENTER]-Done
[↑↓]-Change
[TAB]-Next
[ESC]-Previous Menu
[ENTER]-Select

Figure 10

Step 4:

Under **Sync**, select **Continuous** or **On Request** (Figure 11). When set to **Continuous**, changes made to the data on the master drive will be automatically and continuously copied to the recovery drive when both hard drives are installed in the system. **On Request** allows users to update data from the master drive to the recovery drive manually using the Intel Rapid Storage Technology utility in the operating system. **On Request** also allows users to restore the master drive to a previous state.



```
Intel(R) Rapid Storage Technology - Option ROM - 11.0.0.1339
Copyright(C) 2003-11 Intel Corporation.  All Rights Reserved.

[ CREATE VOLUME MENU ]
      Name :   Volume0
RAID Level :   Recovery
     Disks :   Select Disks
Strip Size :   N/A
  Capacity :   0.0 GB
      Sync :   Continuous
               Create Volume

[ HELP ]
Select a sync option:
On Request: volume is updated manually
Continuous: volume is updated automatically
```

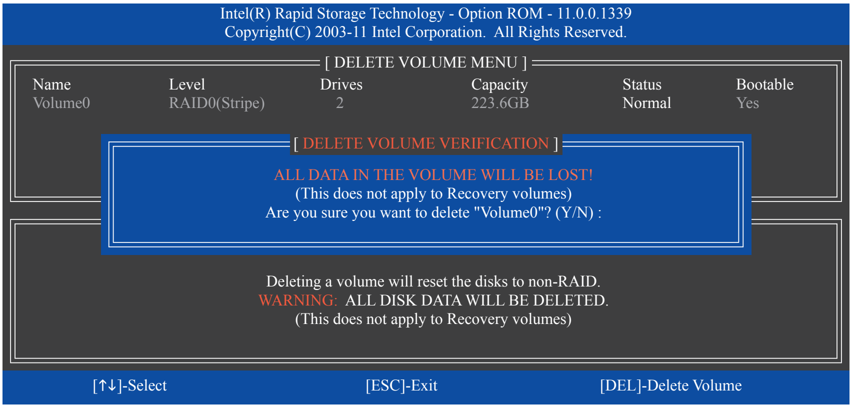
Figure 11

Step 5:

Finally press <Enter> on the **Create Volume** item to begin creating the Recovery Volume and follow the on-screen instructions to complete.

Delete RAID Volume

To delete a RAID array, select **Delete RAID Volume** in **MAIN MENU** and press <Enter>. In the **DELETE VOLUME MENU** section, use the up or down arrow key to select the array to be deleted and press <Delete>. When prompted to confirm your selection (Figure 12), press <Y> to confirm or <N> to abort.



```
            Intel(R) Rapid Storage Technology - Option ROM - 11.0.0.1339
              Copyright(C) 2003-11 Intel Corporation.  All Rights Reserved.

                            [ DELETE VOLUME MENU ]
  Name        Level          Drives      Capacity      Status      Bootable
  Volume0     RAID0(Stripe)    2         223.6GB       Normal      Yes

                    [ DELETE VOLUME VERIFICATION ]
                  ALL DATA IN THE VOLUME WILL BE LOST!
                  (This does not apply to Recovery volumes)
            Are you sure you want to delete "Volume0"? (Y/N) :

                 Deleting a volume will reset the disks to non-RAID.
               WARNING:  ALL DISK DATA WILL BE DELETED.
                 (This does not apply to Recovery volumes)

     [↑↓]-Select              [ESC]-Exit              [DEL]-Delete Volume
```

Figure 12

Acceleration Options

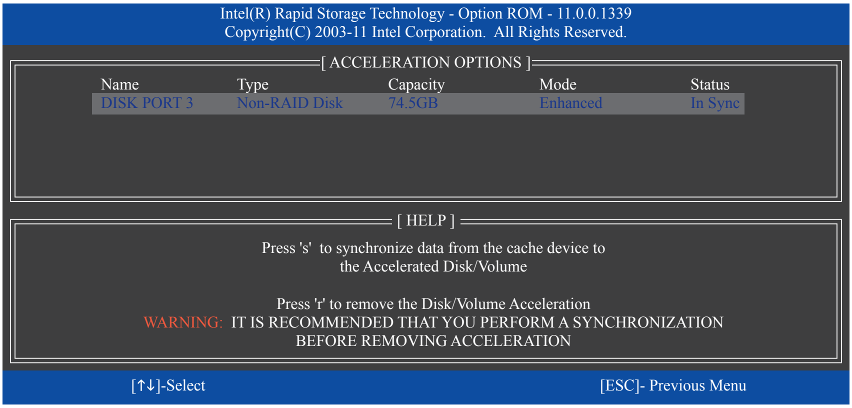
This option allows you to view the status of your accelerated drive/volume (Figure 13) created using the Intel IRST utility. In case you are unable to run the Intel IRST utility due to an application error or operating system issue, you will need to remove acceleration or manually enable synchronization (Maximized mode only) using this option in the RAID ROM utility.

Steps:

Select **Acceleration Options** in **MAIN MENU** and press <Enter>.

To remove the acceleration, select the accelerated drive/volume, press <R>, and press <Y> to confirm.

To synchronize data from the cache device to the accelerated drive/volume, press <S> and press <Y> to confirm.



```
            Intel(R) Rapid Storage Technology - Option ROM - 11.0.0.1339
              Copyright(C) 2003-11 Intel Corporation.  All Rights Reserved.

                           [ ACCELERATION OPTIONS ]
        Name          Type            Capacity        Mode          Status
        DISK PORT 3   Non-RAID Disk   74.5GB          Enhanced      In Sync

                                  [ HELP ]
           Press 's'  to synchronize data from the cache device to
                       the Accelerated Disk/Volume

                 Press 'r' to remove the Disk/Volume Acceleration
     WARNING:  IT IS RECOMMENDED THAT YOU PERFORM A SYNCHRONIZATION
                    BEFORE REMOVING ACCELERATION

          [↑↓]-Select                              [ESC]- Previous Menu
```

Figure 13

5-1-2 Installing the SATA RAID/AHCI Driver and Operating System

With the correct BIOS settings, you are ready to install Windows 7/XP.

A. Installing Windows 7

As Windows 7 already include Intel SATA RAID/AHCI driver, you do not need to install separate RAID/AHCI driver during the Windows installation process. After the operating system is installed, we recommend that you install all required drivers from the motherboard driver disk using "Xpress Install" to ensure system performance and compatibility.

B. Installing Windows XP

Before installing Windows XP, connect a USB floppy disk drive to your computer first because you need to install the SATA RAID/AHCI driver from a floppy disk that contains the driver during the OS installation. Without the driver, the hard drive(s) may not be recognized during the Windows setup process. First, copy the driver from the motherboard driver disk to a floppy disk. Refer to the methods below.

Method A:

For the Intel Z77, copy all files in the **\BootDrv\iRST\32Bit** folder to your floppy disk. To install Windows 64-Bit, copy the files in the **64Bit** folder.

Method B:

Steps:

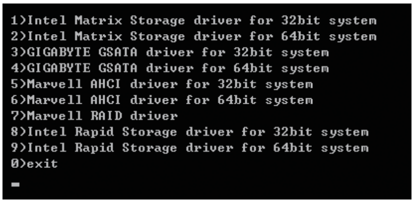
1: Use an alternative system and insert the motherboard driver disk.

2: From your optical drive folder, double click the **Menu.exe** file in the **BootDrv** folder. A Command Prompt window will open similar to that in Figure 1.

3: Insert the blank formatted disk (if you're using a USB floppy disk drive, make sure it is designated as drive A). Select the controller driver by pressing the corresponding letter from the menu and press <Enter>. For example, from the menu in Figure 1,

- For the Intel Z77, select **8) Intel Rapid Storage driver for 32bit system** for Windows XP 32-bit operating system.

Your system will then automatically copy the driver files to the floppy disk. Press any key to exit when finished.



```
1)Intel Matrix Storage driver for 32bit system
2)Intel Matrix Storage driver for 64bit system
3)GIGABYTE GSATA driver for 32bit system
4)GIGABYTE GSATA driver for 64bit system
5)Marvell AHCI driver for 32bit system
6)Marvell AHCI driver for 64bit system
7)Marvell RAID driver
8)Intel Rapid Storage driver for 32bit system
9)Intel Rapid Storage driver for 64bit system
0)exit
_
```

Figure 1

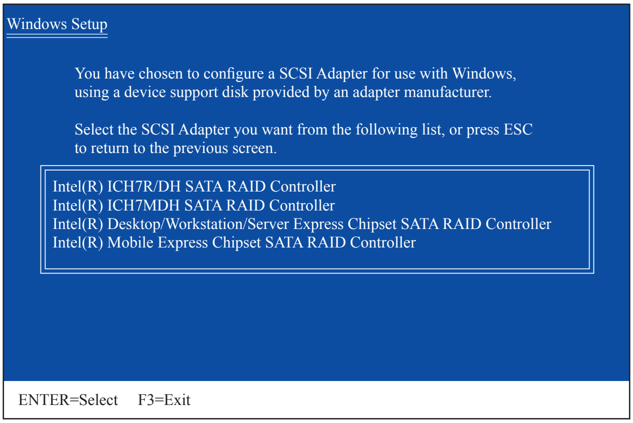
Refer to the following for installing the driver during the Windows setup process.

Step 1:

Restart your system to boot from the Windows XP setup disk and press <F6> as soon as you see the message "Press F6 if you need to install a 3rd party SCSI or RAID driver." A screen will then appear asking you to specify an additional SCSI adapter. Press <S>.

Step 2:

Insert the floppy disk containing the SATA RAID/AHCI driver and press <Enter>. Then a controller menu similar to that in Figure 3 will appear. Select **Intel(R) Desktop/Workstation/Server Express Chipset SATA RAID Controller** and press <Enter>. For AHCI mode, use the up arrow key on the keyboard to scroll to the **Intel(R) Desktop/Workstation/Server Express Chipset SATA AHCI Controller** item and press <Enter>.



Windows Setup

You have chosen to configure a SCSI Adapter for use with Windows,
using a device support disk provided by an adapter manufacturer.

Select the SCSI Adapter you want from the following list, or press ESC
to return to the previous screen.

Intel(R) ICH7R/DH SATA RAID Controller
Intel(R) ICH7MDH SATA RAID Controller
Intel(R) Desktop/Workstation/Server Express Chipset SATA RAID Controller
Intel(R) Mobile Express Chipset SATA RAID Controller

Figure 2

Step 3:

On the next screen, press <Enter> to continue the driver installation. After the driver installation, you can proceed with the Windows XP installation.

C. Rebuilding an Array

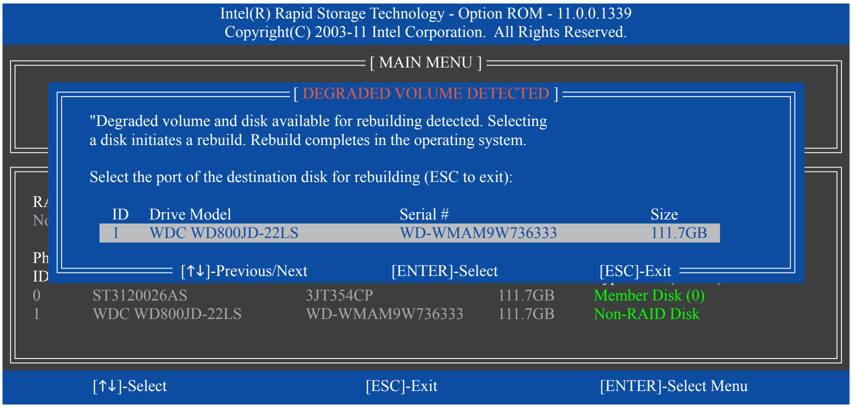
Rebuilding is the process of restoring data to a hard drive from other drives in the array. Rebuilding applies only to fault-tolerant arrays such as RAID 1, RAID 5 or RAID 10 arrays. The procedures below assume a new drive is added to replace a failed drive to rebuild a RAID 1 array. (Note: The new drive must have equal or greater capacity than the old one.)

Turn off your computer and replace the failed hard drive with a new one. Restart your computer.

- **Enabling Automatic Rebuild**

Step 1:

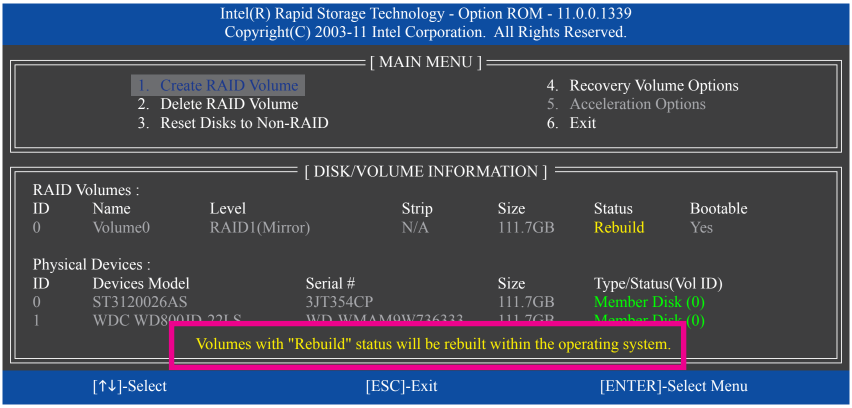
When the message "Press <Ctrl-I> to enter Configuration Utility" appears, press <Ctrl> + <I> to enter the RAID Configuration Utility. The following screen appears after you enter the RAID Configuration Utility.



```
Intel(R) Rapid Storage Technology - Option ROM - 11.0.0.1339
Copyright(C) 2003-11 Intel Corporation.  All Rights Reserved.

[ MAIN MENU ]

[ DEGRADED VOLUME DETECTED ]
"Degraded volume and disk available for rebuilding detected. Selecting
a disk initiates a rebuild. Rebuild completes in the operating system.

Select the port of the destination disk for rebuilding (ESC to exit):

  ID   Drive Model            Serial #              Size
  1    WDC WD800JD-22LS       WD-WMAM9W736333       111.7GB

[↑↓]-Previous/Next      [ENTER]-Select      [ESC]-Exit

RA
No

Ph
ID
0    ST3120026AS        3JT354CP           111.7GB    Member Disk (0)
1    WDC WD800JD-22LS   WD-WMAM9W736333    111.7GB    Non-RAID Disk

[↑↓]-Select          [ESC]-Exit          [ENTER]-Select Menu
```

Step 2:

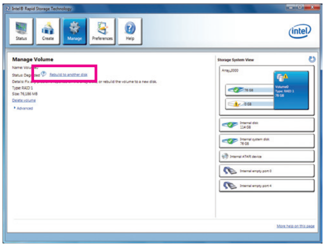
Select the new hard drive to add into the array to be rebuilt and press <Enter>. The following screen appears, indicating that an automatic rebuild will be performed after you enter the operating system (look for the **Intel Rapid Storage Technology** icon in the notification area, which will show that a RAID volume is being rebuilt). If you do not enable automatic rebuild on this stage, you have to manually rebuild the array in the operating system (see the next page for more details).



```
Intel(R) Rapid Storage Technology - Option ROM - 11.0.0.1339
Copyright(C) 2003-11 Intel Corporation.  All Rights Reserved.

[ MAIN MENU ]
     1.  Create RAID Volume            4.  Recovery Volume Options
     2.  Delete RAID Volume            5.  Acceleration Options
     3.  Reset Disks to Non-RAID       6.  Exit

[ DISK/VOLUME INFORMATION ]
RAID Volumes :
ID   Name       Level            Strip   Size      Status    Bootable
0    Volume0    RAID1(Mirror)    N/A     111.7GB   Rebuild   Yes

Physical Devices :
ID   Devices Model      Serial #           Size       Type/Status(Vol ID)
0    ST3120026AS        3JT354CP           111.7GB    Member Disk (0)
1    WDC WD800JD-22LS   WD-WMAM9W736333    111.7GB    Member Disk (0)

Volumes with "Rebuild" status will be rebuilt within the operating system.

[↑↓]-Select          [ESC]-Exit          [ENTER]-Select Menu
```

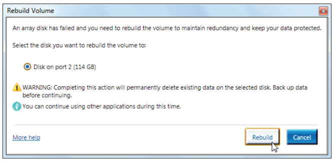
- **Performing the Rebuild in the Operating System**

While in the operating system, make sure the chipset driver has been installed from the motherboard driver disk. Then launch the Intel Rapid Storage Technology utility from **All Programs** in the **Start** menu.


Intel® Rapid Storage Technology
Status
Create
Manage
Preferences
Help
intel
Manage Volume
Rebuild to another disk
Type: RAID 1
Delete volume
Advanced
Storage System View
More help on this page

Step 1:

Go to the **Manage** menu and click **Rebuild to another disk in Manage Volume**.


Rebuild Volume
Rebuild
Cancel
More help

An array disk has failed and you need to rebuild the volume to maintain redundancy and keep your data protected.

Select the disk you want to rebuild the volume to:

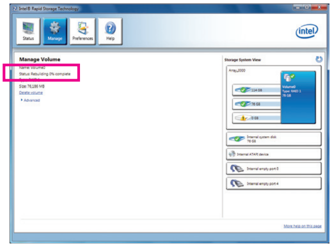
● Disk on port 2 (114 GB)

WARNING: Completing this action will permanently delete existing data on the selected disk. Back up data before continuing.

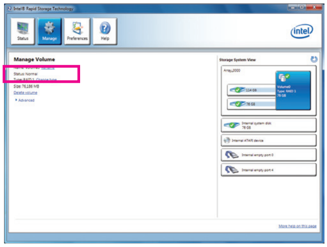
You can continue using other applications during this time.

Step 2:

Select a new drive to rebuild the RAID and click **Rebuild**.


Intel® Rapid Storage Technology
Status
Manage
Preferences
Help
intel
Manage Volume
Status: Rebuilding 0% complete
Delete volume
Advanced
Storage System View
More help on this page

The **Status** item on the left of the screen displays the rebuild progress.


Intel® Rapid Storage Technology
Status
Manage
Preferences
Help
intel
Manage Volume
Status: Normal
Delete volume
Advanced
Storage System View
More help on this page

Step 3:

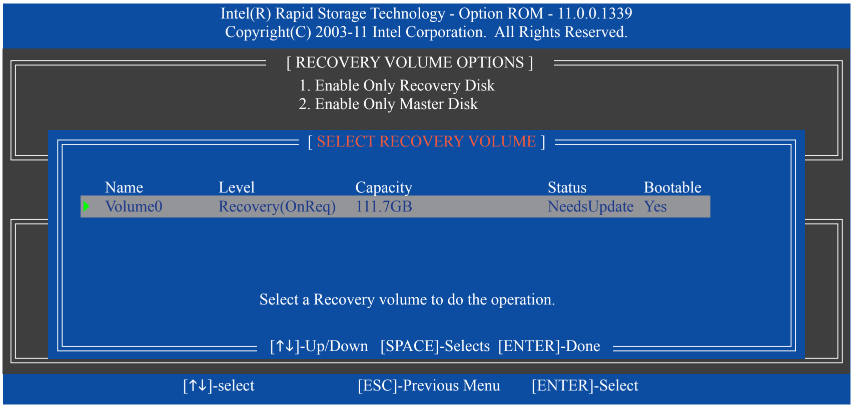
After the RAID 1 volume rebuilding, the **Status** will display as **Normal**.

- **Restoring the Master Drive to a Previous State (for Recovery Volume only)**

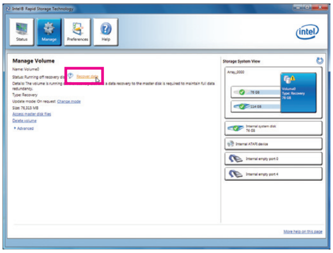
When two hard drives are set to Recovery Volume in Update on Request mode, you can restore the master drive data to the last backup state when needed. For example, in case the master drive detects a virus, you can restore the recovery drive data to the master drive.

Step 1:

Select **4. Recovery Volume Options** in the **MAIN MENU** of the Intel RAID Configuration Utility. On the **RECOVERY VOLUMES OPTIONS** menu, select **Enable Only Recovery Disk** to show the recovery drive in the operating system. Follow the on-screen instructions to complete and exit the RAID Configuration Utility.

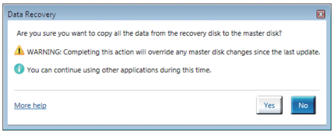


```
Intel(R) Rapid Storage Technology - Option ROM - 11.0.0.1339
Copyright(C) 2003-11 Intel Corporation.  All Rights Reserved.

[ RECOVERY VOLUME OPTIONS ]
1. Enable Only Recovery Disk
2. Enable Only Master Disk

[ SELECT RECOVERY VOLUME ]

Name        Level              Capacity        Status        Bootable
Volume0     Recovery(OnReq)    111.7GB         NeedsUpdate   Yes

Select a Recovery volume to do the operation.

[↑↓]-Up/Down   [SPACE]-Selects  [ENTER]-Done

[↑↓]-select          [ESC]-Previous Menu       [ENTER]-Select
```


Status
Manage
Preferences
Help
intel
Manage Volume
Storage System View

Step 2:

Go to the **Manage** menu of the Intel Rapid Storage Technology utility and click **Recover data** in **Manage Volume**.



Data Recovery

Are you sure you want to copy all the data from the recovery disk to the master disk?

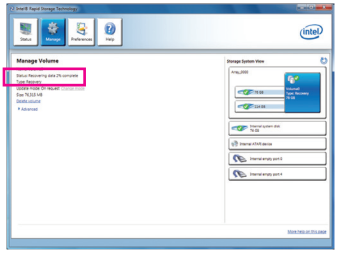
WARNING: Completing this action will override any master disk changes since the last update.

You can continue using other applications during this time.

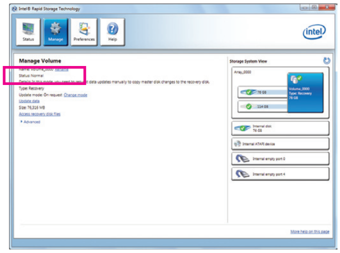
More help
Yes
No

Step 3:

Click **Yes** to begin the data recovery.


Status
Manage
Preferences
Help
intel
Manage Volume
Storage System View

The **Status** item on the left of the screen displays the rebuild progress.


Status
Manage
Preferences
Help
intel
Manage Volume
Storage System View

Step 4:

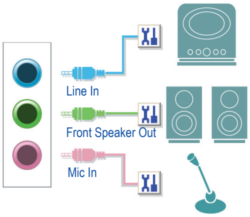
After the recovery volume is completed, the **Status** will display as **Normal**.

5-2 Configuring Audio Input and Output

5-2-1 Configuring 2/4/5.1/7.1-Channel Audio

The motherboard provides three audio jacks on the back panel which support 2/4/5.1/7.1 (Note)-channel audio. The picture to the right shows the default audio jack assignments.

The integrated HD (High Definition) audio provides jack retasking capability that allows the user to change the function for each jack through the audio driver.



- To install a microphone, connect your microphone to the Mic in jack and manually configure the jack for microphone functionality.
- Audio signals will be present on both of the front and back panel audio connections simultaneously. If you want to mute the back panel audio (only supported when using an HD front panel audio module), refer to instructions on page 92.

High Definition Audio (HD Audio)

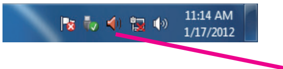
HD Audio includes multiple high quality digital-to-analog converters (DACs) and features multistreaming capabilities that allow multiple audio streams (in and out) to be simultaneously processed. For example, users can listen to MP3 music, have an Internet chat, make a telephone call over the Internet, and etc. all at the same time.

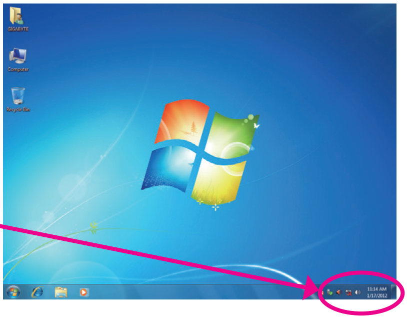
A. Configuring Speakers

(The following instructions use Windows 7 as the example operating system.)

Step 1:

After installing the audio driver, the **HD Audio Manager** icon 🔈 will appear in the notification area. Double-click the icon to access the **HD Audio Manager**.





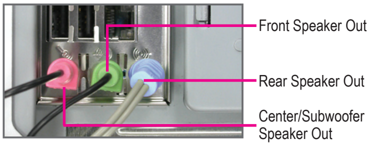
(Note) 2/4/5.1/7.1-Channel Audio Configurations:

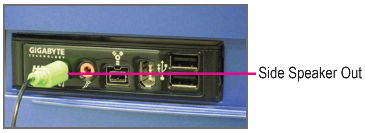
Refer to the following for multi-channel speaker configurations.

- 2-channel audio: Headphone or Line out.
- 4-channel audio: Front speaker out and Rear speaker out.
- 5.1-channel audio: Front speaker out, Rear speaker out, and Center/Subwoofer speaker out.
- 7.1-channel audio: Front speaker out, Rear speaker out, Center/Subwoofer speaker out, and Side speaker out.

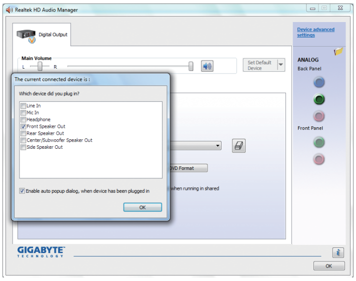
The pictures to the right show the 7.1-channel speaker configurations.

7.1-Channel Speakers:


Front Speaker Out
Rear Speaker Out
Center/Subwoofer Speaker Out


Side Speaker Out
GIGABYTE TECHNOLOGY

Step 2:
Connect an audio device to an audio jack. The **The current connected device is** dialog box appears. Select the device according to the type of device you connect. Then click **OK**.


Realtek HD Audio Manager
Digital Output
Device advanced settings
Main Volume
L
R
Set Default Device
ANALOG
Back Panel
Front Panel
DVD Format
when running in shared
OK
GIGABYTE TECHNOLOGY
OK

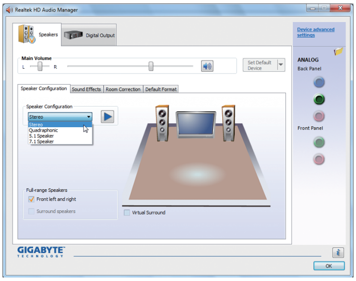
The current connected device is :

Which device did you plug in?

☐ Line In
☐ Mic In
☐ Headphone
☑ Front Speaker Out
☐ Rear Speaker Out
☐ Center/Subwoofer Speaker Out
☐ Side Speaker Out

☑ Enable auto popup dialog, when device has been plugged in

Step 3:
On the **Speakers** screen, click the **Speaker Configuration** tab. In the **Speaker Configuration** list, select **Stereo**, **Quadraphonic**, **5.1 Speaker**, or **7.1 Speaker** according to the type of speaker configuration you wish to set up. Then the speaker setup is completed.


Realtek HD Audio Manager
Speakers
Digital Output
Device advanced settings
Main Volume
L
R
Set Default Device
Speaker Configuration
Sound Effects
Room Correction
Default Format
ANALOG
Back Panel
Front Panel
GIGABYTE TECHNOLOGY
OK

Speaker Configuration: Stereo

Stereo
Quadraphonic
5.1 Speaker
7.1 Speaker

Full-range Speakers
☑ Front left and right
☐ Surround speakers

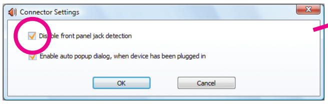
☐ Virtual Surround

B. Configuring Sound Effect

You may configure an audio environment on the **Sound Effects** tab.

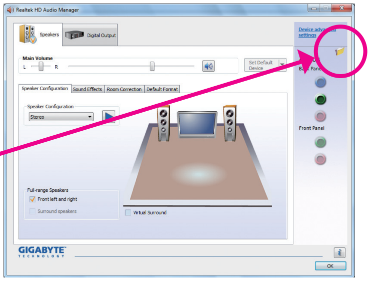
C. Activating an AC'97 Front Panel Audio Module

If your chassis provides an AC'97 front panel audio module, to activate the AC'97 functionality, click the tool icon on the **Speaker Configuration** tab. On the **Connector Settings** dialog box, select the **Disable front panel jack detection** check box. Click **OK** to complete.


Connector Settings

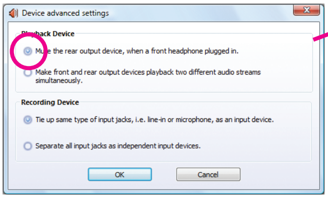
☑ Disable front panel jack detection

☑ Enable auto popup dialog, when device has been plugged in


Realtek HD Audio Manager
Speakers
Digital Output
Device advanced settings
Main Volume
L
R
Set Default Device
Back Panel
Speaker Configuration
Sound Effects
Room Correction
Default Format
Stereo
Front Panel
Full-range Speakers
Front left and right
Surround speakers
Virtual Surround
GIGABYTE
OK

D. Muting the Back Panel Audio (For HD Audio Only)

Click **Device advanced settings** on the top right corner on the **Speaker Configuration** tab to open the **Device advanced settings** dialog box. Select the **Mute the rear output device, when a front headphone plugged in** check box. Click **OK** to complete.


Device advanced settings

Playback Device

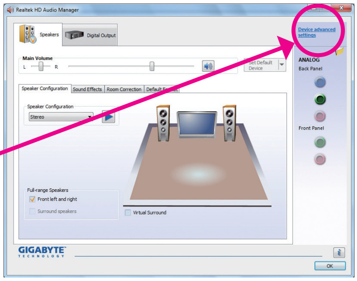
● Mute the rear output device, when a front headphone plugged in.

○ Make front and rear output devices playback two different audio streams simultaneously.

Recording Device

● Tie up same type of input jacks, i.e. line-in or microphone, as an input device.

○ Separate all input jacks as independent input devices.

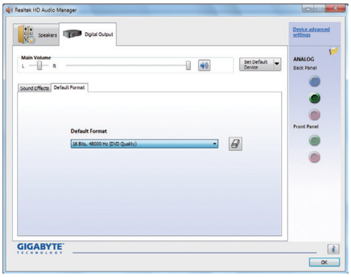

Realtek HD Audio Manager
Speakers
Digital Output
Device advanced settings
Main Volume
L
R
Set Default Device
ANALOG
Back Panel
Speaker Configuration
Sound Effects
Room Correction
Default Format
Stereo
Front Panel
Full-range Speakers
Front left and right
Surround speakers
Virtual Surround
GIGABYTE
OK

5-2-2 Configuring S/PDIF Out

The S/PDIF Out jack can transmit audio signals to an external decoder for decoding to get the best audio quality.

Configuring S/PDIF Out:

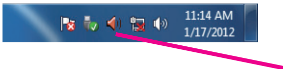
On the **Digital Output** screen, click the **Default Format** tab and then select the sample rate and bit depth. Click **OK** to complete.

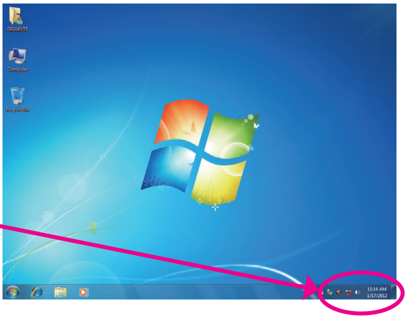

Default Format: 16 Bits, 48000 Hz (DVD Quality)

Realtek HD Audio Manager
Speakers
Digital Output
Device advanced settings
Main Volume
L
R
Set Default Device
ANALOG
Back Panel
Sound Effects
Default Format
Front Panel
GIGABYTE
OK

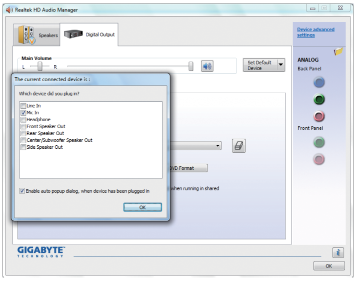
5-2-3 Configuring Microphone Recording

Step 1:
After installing the audio driver, the **HD Audio Manager** icon 🔊 will appear in the notification area. Double-click the icon to access the **HD Audio Manager**.


11:14 AM
1/17/2012


GIGABYTE
Computer
Recycle Bin
11:14 AM
1/17/2012

Step 2:
Connect your microphone to the Mic in jack (pink) on the back panel or the Mic in jack (pink) on the front panel. Then configure the jack for microphone functionality.
Note: The microphone functions on the front panel and back panel cannot be used at the same time.


Realtek HD Audio Manager
Speakers
Digital Output
Device advanced settings
Main Volume
L
R
Set Default Device
ANALOG
Back Panel
Front Panel
DVD Format
GIGABYTE TECHNOLOGY
OK

The current connected device is :

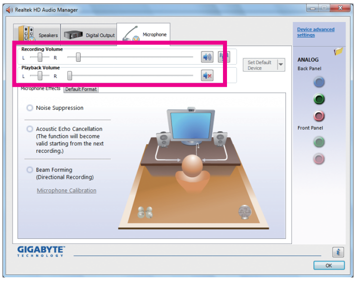
Which device did you plug in?

☐ Line In
☑ Mic In
☐ Headphone
☐ Front Speaker Out
☐ Rear Speaker Out
☐ Center/Subwoofer Speaker Out
☐ Side Speaker Out

☑ Enable auto popup dialog, when device has been plugged in

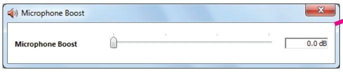
OK

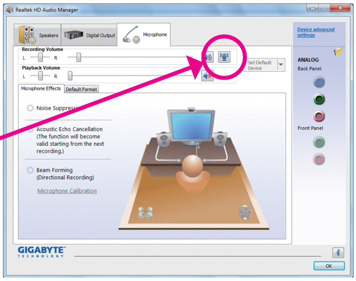
Step 3:
Go to the **Microphone** screen. Do not mute the recording volume, or you'll not be able to record the sound. To hear the sound being recorded during the recording process, do not mute the playback volume. It is recommended that you set the volumes at a middle level.


Realtek HD Audio Manager
Speakers
Digital Output
Microphone
Device advanced settings
Recording Volume
L
R
Playback Volume
Set Default Device
Microphone Effects
Default Format
ANALOG
Back Panel
Front Panel
GIGABYTE TECHNOLOGY
OK

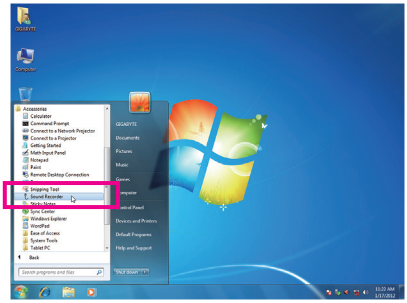
○ Noise Suppression
○ Acoustic Echo Cancellation (The function will become valid starting from the next recording.)
○ Beam Forming (Directional Recording)
Microphone Calibration

Step 4:
To raise the recording and playback volume for the microphone, click the **Microphone Boost** icon 🎙 on the right of the **Recording Volume** slider and set the Microphone Boost level.


Microphone Boost
Microphone Boost
0.0 dB


Realtek HD Audio Manager
Speakers
Digital Output
Microphone
Device advanced settings
Recording Volume
L
R
Playback Volume
Set Default Device
Microphone Effects
Default Format
Noise Suppress
Acoustic Echo Cancellation (The function will become valid starting from the next recording.)
Beam Forming (Directional Recording)
Microphone Calibration
ANALOG
Back Panel
Front Panel
GIGABYTE TECHNOLOGY
OK

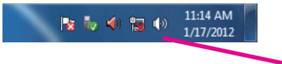
Step 5:
After completing the settings above, click **Start**, point to **All Programs**, point to **Accessories**, and then click **Sound Recorder** to begin the sound recording.

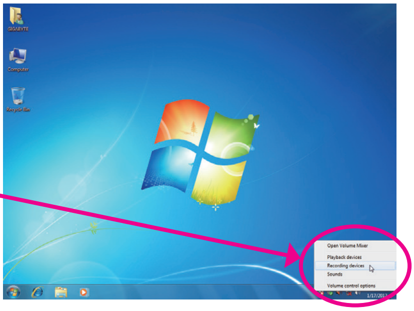

Accessories
Calculator
Command Prompt
Connect to a Network Projector
Connect to a Projector
Getting Started
Math Input Panel
Notepad
Paint
Remote Desktop Connection
Snipping Tool
Sound Recorder
Sticky Notes
Sync Center
Windows Explorer
WordPad
Ease of Access
System Tools
Tablet PC
Back
Search programs and files
GIGABYTE
Documents
Pictures
Music
Games
Computer
Control Panel
Devices and Printers
Default Programs
Help and Support
Shut down
11:22 AM
1/17/2012

* Enabling Stereo Mix

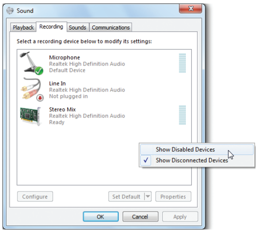
If the HD Audio Manager does not display the recording device you wish to use, refer to the steps below. The following steps explain how to enable Stereo Mix (which may be needed when you want to record sound from your computer).

Step 1:
Locate the 🔊 icon in the notification area and right-click on this icon. Select **Recording Devices**.

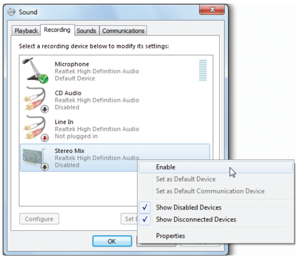

11:14 AM
1/17/2012


Open Volume Mixer
Playback devices
Recording devices
Sounds
Volume control options

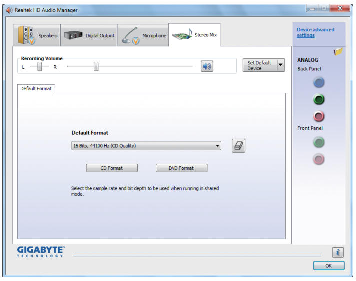
Step 2:
On the **Recording** tab, right-click on an empty space and select **Show Disabled Devices**.


Sound
Playback
Recording
Sounds
Communications
Select a recording device below to modify its settings:
Microphone
Realtek High Definition Audio
Default Device
Line In
Realtek High Definition Audio
Not plugged in
Stereo Mix
Realtek High Definition Audio
Ready
Show Disabled Devices
✓ Show Disconnected Devices
Configure
Set Default
Properties
OK
Cancel
Apply

Step 3:
When the **Stereo Mix** item appears, right-click on this item and select **Enable**. Then set it as the default device.


Sound
Playback
Recording
Sounds
Communications
Select a recording device below to modify its settings:
Microphone
Realtek High Definition Audio
Default Device
CD Audio
Realtek High Definition Audio
Disabled
Line In
Realtek High Definition Audio
Not plugged in
Stereo Mix
Realtek High Definition Audio
Disabled
Enable
Set as Default Device
Set as Default Communication Device
✓ Show Disabled Devices
✓ Show Disconnected Devices
Properties
Configure
OK

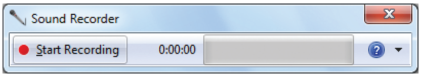
Step 4:
Now you can access the **HD Audio Manager** to configure **Stereo Mix** and use **Sound Recorder** to record the sound.


Realtek HD Audio Manager
Speakers
Digital Output
Microphone
Stereo Mix
Device advanced settings
Recording Volume
L
R
Set Default Device
ANALOG
Back Panel
Front Panel
Default Format
CD Format
DVD Format
GIGABYTE TECHNOLOGY
OK

Default Format: 16 Bits, 44100 Hz (CD Quality)

Select the sample rate and bit depth to be used when running in shared mode.

5-2-4 Using the Sound Recorder


Sound Recorder
Start Recording
0:00:00

A. Recording Sound

1. Make sure you have connected the sound input device (e.g. microphone) to the computer.
2. To record the audio, click the **Start Recording** button ● Start Recording.
3. To stop recording audio, click the **Stop Recording** button ■ Stop Recording.

Be sure to save the recorded audio file upon completion.

B. Playing the Recorded Sound

You can play your recording in a digital media player program that supports your audio file format.

5-3 Troubleshooting

5-3-1 Frequently Asked Questions

To read more FAQs for your motherboard, please go to the **Support & Downloads\FAQ** page on GIGABYTE's website.

Q: Why is the light of my keyboard/optical mouse still on after the computer shuts down?

A: Some motherboards provide a small amount of standby power after the computer shuts down and that's why the light is still on.

Q: How do I clear the CMOS values?

A: For motherboards that have a Clear CMOS button, press this button to clear the CMOS values (before doing this, please turn off the computer and unplug the power cord). For motherboards that have a Clear CMOS jumper, refer to the instructions in Chapter 1 to short the jumper to clear the CMOS values. If your board doesn't have this jumper/button, refer to the instructions on the motherboard battery in Chapter 1. You can temporarily remove the battery from the battery holder to stop supplying power to the CMOS, which will clear the CMOS values after about one minute.

Q: Why do I still get a weak sound even though I have turned my speaker to the maximum volume?

A: Make sure your speaker is equipped with an internal amplifier. If not, try a speaker with power/amplifier.

Q: Why cannot I install the onboard HD audio driver successfully? (For Windows XP only)

A: Step 1: First, make sure Service Pack 1 or Service Pack 2 has been installed (check in My Computer > Properties > General > System). If not, please update it from Microsoft's website. Then make sure the Microsoft UAA Bus Driver for High Definition Audio has been installed successfully (check in My Computer > Properties > Hardware > Device Manager > System Devices).

Step 2: Check if **Audio Device on High Definition Audio Bus** or **Unknown device** is present in **Device Manager** or **Sound, video, and game controllers**. If yes, please disable this device. (If not, skip this step.)

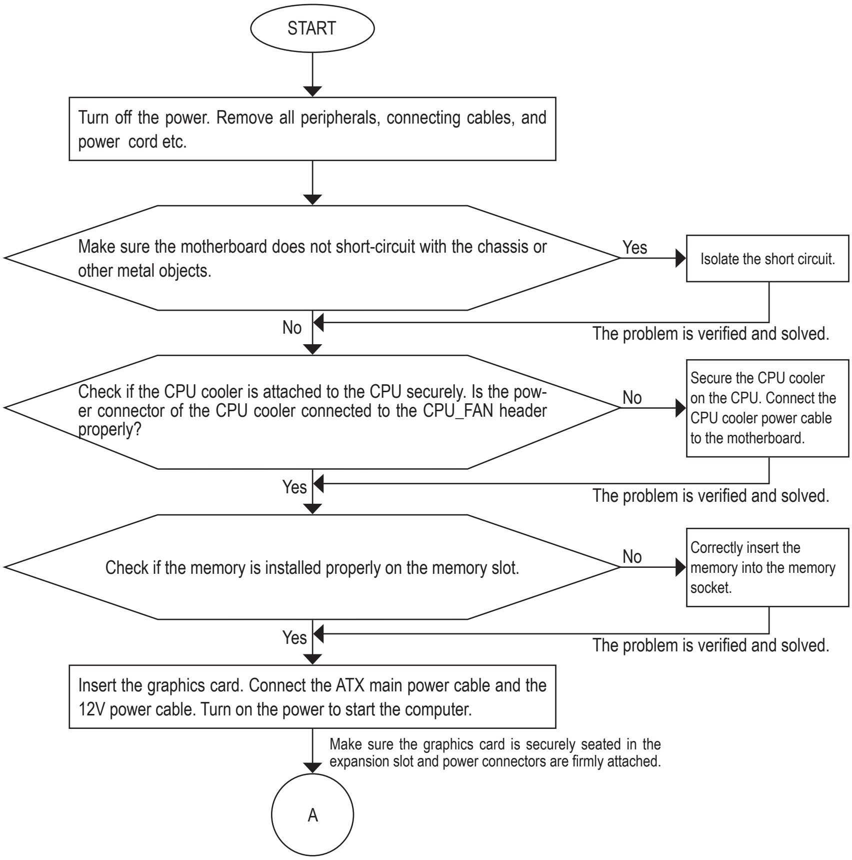
Step 3: Then go back to My Computer > Properties > Hardware > Device Manager > System devices and right-click on **Microsoft UAA Bus Driver for High Definition Audio** and select **Disable** and **Uninstall**.

Step 4: In **Device Manager**, right-click on the computer name and select **Scan for hardware changes**. When the **Add New Hardware Wizard** appears, click **Cancel**. Then install the onboard HD audio driver from the motherboard driver disk or download the audio driver from GIGABYTE's website to install.

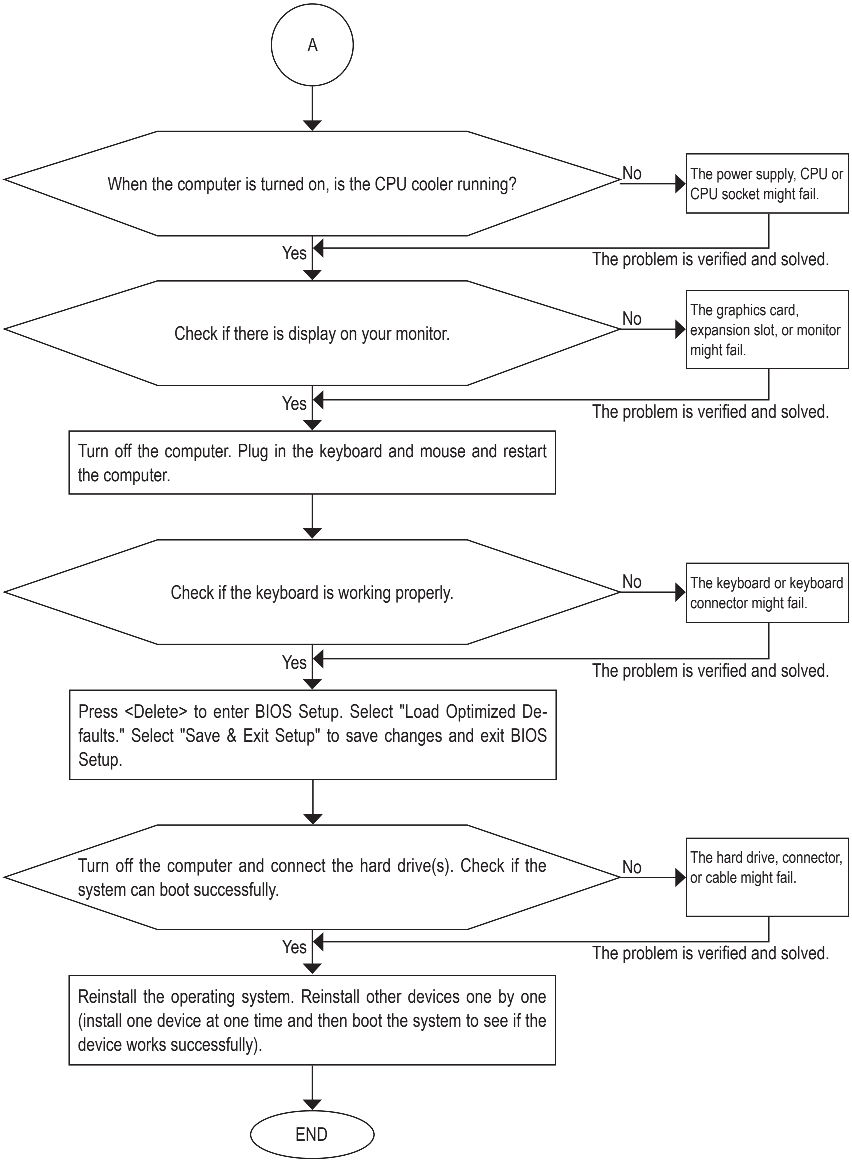
For more details, go to the **Support & Downloads\FAQ** page on our website and search for "onboard HD audio driver."

5-3-2 Troubleshooting Procedure

If you encounter any troubles during system startup, follow the troubleshooting procedure below to solve the problem.


START
Turn off the power. Remove all peripherals, connecting cables, and power cord etc.
Make sure the motherboard does not short-circuit with the chassis or other metal objects.
Yes
Isolate the short circuit.
No
The problem is verified and solved.
Check if the CPU cooler is attached to the CPU securely. Is the power connector of the CPU cooler connected to the CPU_FAN header properly?
No
Secure the CPU cooler on the CPU. Connect the CPU cooler power cable to the motherboard.
Yes
The problem is verified and solved.
Check if the memory is installed properly on the memory slot.
No
Correctly insert the memory into the memory socket.
Yes
The problem is verified and solved.
Insert the graphics card. Connect the ATX main power cable and the 12V power cable. Turn on the power to start the computer.
Make sure the graphics card is securely seated in the expansion slot and power connectors are firmly attached.
A

(Continued...)


A
When the computer is turned on, is the CPU cooler running?
No
The power supply, CPU or CPU socket might fail.
The problem is verified and solved.
Yes
Check if there is display on your monitor.
No
The graphics card, expansion slot, or monitor might fail.
The problem is verified and solved.
Yes
Turn off the computer. Plug in the keyboard and mouse and restart the computer.
Check if the keyboard is working properly.
No
The keyboard or keyboard connector might fail.
The problem is verified and solved.
Yes
Press <Delete> to enter BIOS Setup. Select "Load Optimized Defaults." Select "Save & Exit Setup" to save changes and exit BIOS Setup.
Turn off the computer and connect the hard drive(s). Check if the system can boot successfully.
No
The hard drive, connector, or cable might fail.
The problem is verified and solved.
Yes
Reinstall the operating system. Reinstall other devices one by one (install one device at one time and then boot the system to see if the device works successfully).
END

If the procedure above is unable to solve your problem, contact the place of purchase or local dealer for help. Or go to the **Support & Downloads\Technical Support** page to submit your question. Our customer service staff will reply you as soon as possible.

5-3-3 Regulatory Statements

Regulatory Notices

This document must not be copied without our written permission, and the contents there of must not be imparted to a third party nor be used for any unauthorized purpose. Contravention will be prosecuted. We believe that the information contained herein was accurate in all respects at the time of printing. GIGABYTE cannot, however, assume any responsibility for errors or omissions in this text. Also note that the information in this document is subject to change without notice and should not be construed as a commitment by GIGABYTE.

Our Commitment to Preserving the Environment

In addition to high-efficiency performance, all GIGABYTE motherboards fulfill European Union regulations for RoHS (Restriction of Certain Hazardous Substances in Electrical and Electronic Equipment) and WEEE (Waste Electrical and Electronic Equipment) environmental directives, as well as most major worldwide safety requirements. To prevent releases of harmful substances into the environment and to maximize the use of our natural resources, GIGABYTE provides the following information on how you can responsibly recycle or reuse most of the materials in your "end of life" product.

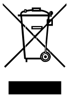
Restriction of Hazardous Substances (RoHS) Directive Statement

GIGABYTE products have not intended to add and safe from hazardous substances (Cd, Pb, Hg, Cr+6, PBDE and PBB). The parts and components have been carefully selected to meet RoHS requirement. Moreover, we at GIGABYTE are continuing our efforts to develop products that do not use internationally banned toxic chemicals.

Waste Electrical & Electronic Equipment (WEEE) Directive Statement

GIGABYTE will fulfill the national laws as interpreted from the 2002/96/EC WEEE (Waste Electrical and Electronic Equipment) directive. The WEEE Directive specifies the treatment, collection, recycling and disposal of electric and electronic devices and their components. Under the Directive, used equipment must be marked, collected separately, and disposed of properly.

WEEE Symbol Statement



The symbol shown below is on the product or on its packaging, which indicates that this product must not be disposed of with other waste. Instead, the device should be taken to the waste collection centers for activation of the treatment, collection, recycling and disposal procedure. The separate collection and recycling of your waste equipment at the time of disposal will help to conserve natural resources and ensure that it is recycled in a manner that protects human health and the environment. For more information about where you can drop off your waste equipment for recycling, please contact your local government office, your household waste disposal service or where you purchased the product for details of environmentally safe recycling.

- When your electrical or electronic equipment is no longer useful to you, "take it back" to your local or regional waste collection administration for recycling.
- If you need further assistance in recycling, reusing in your "end of life" product, you may contact us at the Customer Care number listed in your product's user's manual and we will be glad to help you with your effort.

Finally, we suggest that you practice other environmentally friendly actions by understanding and using the energy-saving features of this product (where applicable), recycling the inner and outer packaging (including shipping containers) this product was delivered in, and by disposing of or recycling used batteries properly. With your help, we can reduce the amount of natural resources needed to produce electrical and electronic equipment, minimize the use of landfills for the disposal of "end of life" products, and generally improve our quality of life by ensuring that potentially hazardous substances are not released into the environment and are disposed of properly.

Contact Us

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FAX: +886-2-8912-4003
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http://ggts.gigabyte.com.tw
WEB address (English): http://www.gigabyte.com
WEB address (Chinese): http://www.gigabyte.tw

- **G.B.T. INC. - U.S.A.**

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Warranty Info: http://rma.gigabyte.us
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- **Thailand**

WEB address : http://th.giga-byte.com

- **Vietnam**

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FAX: +86-27-87851330
GuangZhou
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FAX: +86-20-87544306
Chengdu
TEL: +86-28-85236930
FAX: +86-28-85256822
Xian
TEL: +86-29-85531943
FAX: +86-29-85510930
Shenyang
TEL: +86-24-83992901
FAX: +86-24-83992909

- **GIGABYTE TECHNOLOGY (INDIA) LIMITED - India**

WEB address : http://www.gigabyte.in

- **Saudi Arabia**

WEB address : http://www.gigabyte.com.sa

- **Gigabyte Technology Pty. Ltd. - Australia**

WEB address : http://www.gigabyte.com.au

- **G.B.T. TECHNOLOGY TRADING GMBH - Germany**

WEB address : http://www.gigabyte.de

- **G.B.T. TECH. CO., LTD. - U.K.**

WEB address : http://www.giga-byte.co.uk

- **Giga-Byte Technology B.V. - The Netherlands**

WEB address : http://www.giga-byte.nl

- **GIGABYTE TECHNOLOGY FRANCE - France**

WEB address : http://www.gigabyte.fr

- **Sweden**

WEB address : http://www.gigabyte.se

- **Italy**

WEB address : http://www.giga-byte.it

- **Spain**

WEB address : http://www.giga-byte.es

- **Greece**

WEB address : http://www.gigabyte.com.gr

- **Czech Republic**

WEB address : http://www.gigabyte.cz

- **Hungary**

WEB address : http://www.giga-byte.hu

- **Turkey**

WEB address : http://www.gigabyte.com.tr

- **Russia**

WEB address : http://www.gigabyte.ru

- **Poland**

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- **Ukraine**

WEB address : http://www.gigabyte.ua

- **Romania**

WEB address : http://www.gigabyte.com.ro

- **Serbia**

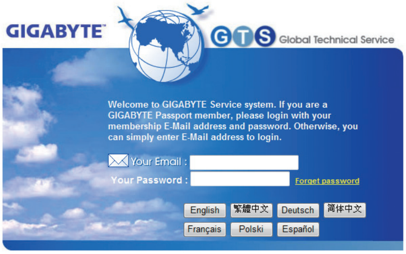
WEB address : http://www.gigabyte.co.rs

- **Kazakhstan**

WEB address : http://www.gigabyte.kz

You may go to the GIGABYTE website, select your language in the language list on the top right corner of the website.

• GIGABYTE Global Service System



Welcome to GIGABYTE Service system. If you are a GIGABYTE Passport member, please login with your membership E-Mail address and password. Otherwise, you can simply enter E-Mail address to login.

To submit a technical or non-technical (Sales/Marketing) question, please link to:
http://ggts.gigabyte.com.tw
Then select your language to enter the system.